

**Subject Coverage and
Arrangement of Abstracts
by Sections in
Chemical Abstracts**

1997 Edition

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Introduction

This manual, “*Subject Coverage and Arrangement of Abstracts by Sections in CHEMICAL ABSTRACTS*” (commonly referred to as the Subject Coverage Manual), is a statement of the guidelines and policies that identify the subject content of and the arrangement of abstracts within *CHEMICAL ABSTRACTS (CA)*. It is intended both for internal editorial use and to help the users of *CA* and of the computer-readable services in locating the *CA* sections and subsections that contain the subjects of interest. It is not a thesaurus, and there is no direct relationship between the section descriptions and the terms used in the *CA* issue, volume, and collective indexes.

The 80 sections of *CA* are used to group abstracts on various specific aspects of chemistry so that users can focus on areas of particular interest. The section titles are intended to be descriptive, but they are subject to more than one interpretation based on the scientific backgrounds, points of view, and objectives of different readers. The detailed descriptions provide the classification scheme for placing abstracts in one of the 80 sections, and should help to overcome some of these differences of interpretation.

The following parts of this prefatory material include general statements of practices of section placement and cross-referring. General criteria for subject coverage appear at the beginning of the main part of this manual, followed by descriptions for each of the 80 sections. The topics discussed in these descriptions provide additional detail within the context of the subjects covered. The statements of content serve as more than a classification scheme, they also provide a definition of what constitutes the chemical and chemical engineering literature to which *CA* provides access.

An illustrative guide to the descriptions of the individual sections is included at the end of this Introduction.

Section Placement and Cross-References

An abstract is placed on the basis of its main subject thrust and interest in only one section and subsection. Subject content as emphasized by the author is the key to proper placement.

In the vast majority of cases, the abstract of a given document can be unequivocally assigned to a specific *CA* section and subsection on the basis of subject content. It is not uncommon, however, that the subject content is mixed, and the abstract might logically fit into two or more different sections. Since abstracts are not duplicated in another section, the document analyst determines the prime emphasis as presented by the author and places the abstract in the section most appropriate for the subject matter.

Occasionally a placement dilemma arises in which nearly equal author emphasis is given to basic research (or theory) and to its application. In such cases, section cross-references and adequate keyword, substance, and concept index entries are applied to assure access for all potential users of the information.

Cross-references for subject matter appropriate to other sections are intended to provide additional access points for users of the *CA* database, regardless of where abstracts are placed. Abstract cross-references appear at the end of each section in the printed issues of *CA*. They consist of section numbers, abstract numbers, and the titles of abstracts that appear in other sections. The cross-references are also posted as search terms in the online files and are incorporated into certain search profiles for other CAS publications.

Cross-references are generated by the document analyst, whose editorial and technical judgment determines whether any particular cross-reference is warranted. Cross-references are made when there is substantial interest expressed by an author in subject matter appropriate for another section. They are not made merely because of some minor relation to another subject area; nearly every abstract embodies to one degree or another a variety of subject interests that may be peripheral to the major thrust of the document. Cross-references are properly used when clearly justified to correlate significant subject areas and/or when the analyst chooses one particular section for placement from two or more that might just as well be selected.

Many of the section descriptions include recommendations for cross-references to be made for frequently occurring situations in which the subject matter could reasonably be regarded as appropriate for another section. Such recommendations are followed unless the other section is clearly not appropriate for the particular study.

Examples:

An abstract dealing with the synthesis of an alkaloidal substance is preferentially placed in Section 31 (Alkaloids), rather than in one of the other organic chemistry sections appropriate to its structure, since it belongs to a group of organic chemicals, the alkaloids, which have a specific set of chemical properties.

The abstract of a paper that deals with both the isolation of a terpene from a plant source and its laboratory synthesis could logically be placed either in Section 11 (Plant Biochemistry) or in Section 30 (Terpenes and Terpenoids). The document analyst determines which one of these subjects represents the major emphasis of the author and places the abstract accordingly. The placement is supported with one or more section cross-references, ample keywording, and in-depth subject indexing, so as to cover all significant aspects of the research.

A paper places essentially equal emphasis on various physicochemical properties of a semiconductor and on its use in a photoimaging device. The candidate sections are 76 (Electric Phenomena) and 74 (Radiation Chemistry, Photochemistry, and Photographic and other Reprographic Processes). In such a case, precedence is given to the more basic research aspects of the work, and the abstract is placed in Section 76, with a cross-reference being made to Section 74.

An abstract describing a dye synthesis followed by information on the use of the dye in color photography is placed in Section 41 (Dyes, Organic Pigments, Fluorescent Brighteners, and Photographic Sensitizers). A cross-reference is given to Section 74.

One of the more difficult subjects to categorize for *CA* is analytical chemistry. Much chemical and chemical engineering research and investigation focuses upon the determination, both qualitative and quantitative, of the composition of matter. Four sections:

- Section 9: (Biochemical Methods)
- Section 64: (Pharmaceutical Analysis)
- Section 79: (Inorganic Chemical Analysis)
- Section 80: (Organic Chemical Analysis)

are devoted nearly exclusively to chemical analytical methods. (Section 9 also covers various nonanalytical procedures and laboratory operations of interest to biochemistry.)

In addition to these four sections that emphasize analytical chemistry, some 40 others include the methods of analysis that pertain to their specialized subject areas. For example, Section 1 (Pharmacology) includes abstracts relating specifically to methods of drug analysis in biological systems (see Section 1, A.1). Likewise, Section 39 (Synthetic Elastomers and Natural Rubber) covers the analysis of synthetic elastomers and natural rubber (see Section 39, A.2). And environmental analysis is included in the most appropriate of the three sections, 59 (Air Pollution and Industrial Hygiene), 60 (Waste Treatment and Disposal), or 61 (Water).

Such terms as "Analysis" and "Spectra analysis" in the index to this manual provide access to the many abstracts concerned with the subject of chemical analysis appearing throughout the various sections of *CA*.

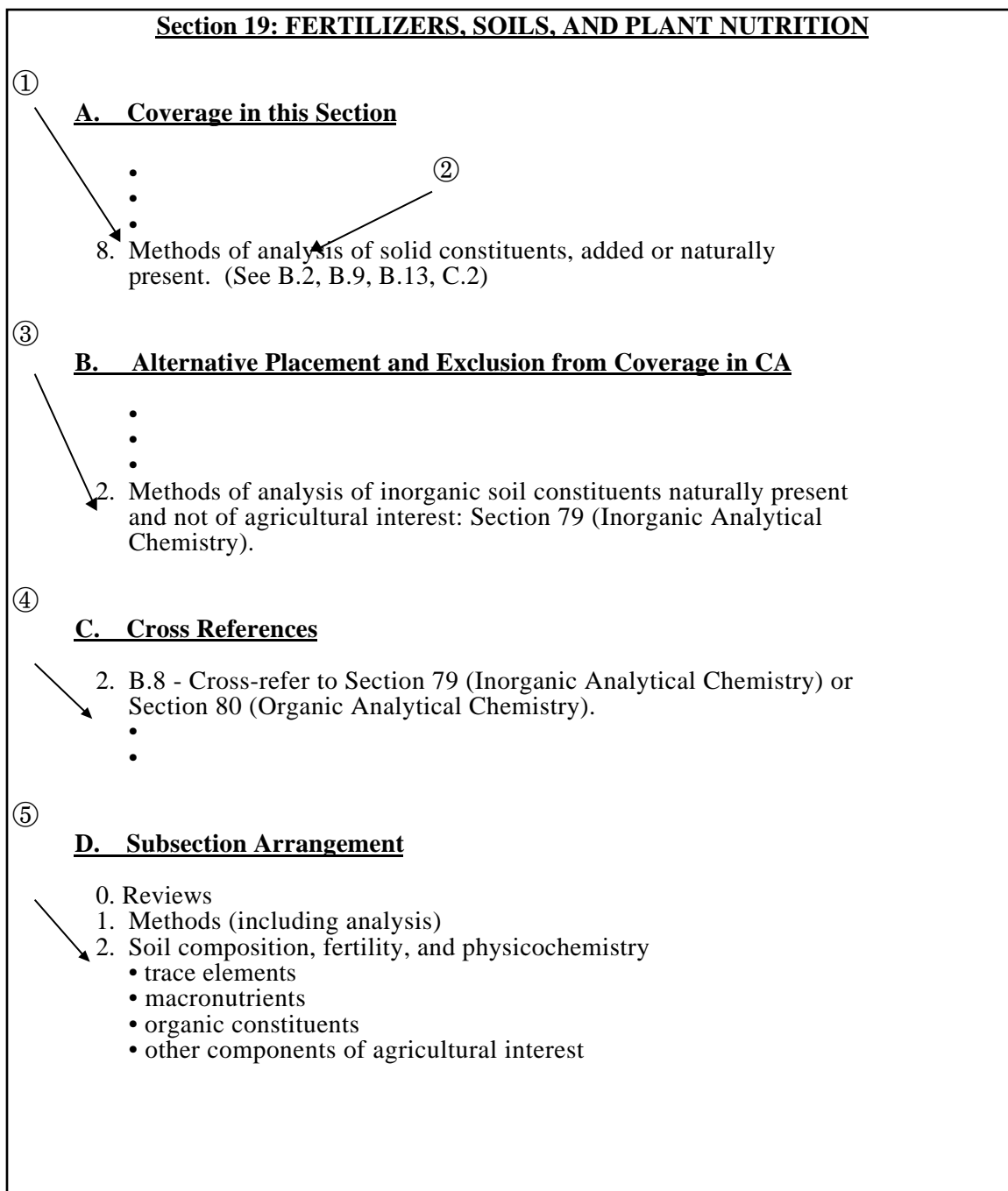
How To Use This Manual

The general guidelines given in this introduction and the discussion of General Subject Coverage Criteria that follows provide the primary frame of reference for coverage in *CA*. The individual descriptions for each of the 80 sections that follow delineate the coverage and subsection arrangement appropriate for the particular section.

Each description is divided into four parts:

- A. Part A consists of statements of subject coverage. Some policy statements are accompanied by references in the form of a letter and number (e.g., B.2) that lead to related information appearing in the following Part B.
- B. Part B presents rules for the placement of related or borderline subjects, of subjects that might justify their appearance in more than one section, and of exceptions to the inclusion statements in Part A. Also included here are statements of exclusion for material that is not appropriate for coverage in *CA*.
- C. Part C states the recommendations for section cross-references. Cross-references are provided by document analysts in accordance with policies stated in Parts A and B, and on the basis of their editorial judgment. (Cf. the discussion on pp. iv-vi above).
- D. Part D describes the arrangement of abstracts by subsection, denoted by number. Topics included within the subsections are detailed in various ways. This information provides further explanation and examples of the types of subject matter included in the particular subsection, and does not indicate any further subdivision. The subsection arrangement applies to all types of abstracts that appear in *CA* (i.e., for journal articles, reports, dissertations, book announcements, and patents).

Illustrative Guide



Key To Illustrative Guide

- ① A.8 is a policy statement of subject coverage and placement for Section 19.
- ② The parenthetical expressions refer to coverage or placement policies for closely related topics or to qualifications of the stated policies that appear in Part A. Also included are references to Part C, where the recommendations for section cross-references appear.
- ③ B.2 is a qualifying statement that identifies the placement of abstracts concerned with certain aspects of soil constituents or residues appropriate to other sections.
- ④ Recommended cross-references to other sections are specified in Part C. Additional section cross-references are made at the discretion of the document analyst, based on editorial judgement. (The absence of cross-reference recommendations does not imply that cross-references are not made when warranted).
- ⑤ The abstracts are arranged within the section according to a subsection subject listing, as shown in Part D. Additional terms appearing in the subsections help to identify the subjects that are included there. These terms are informational only; they do not imply any further arrangement within the subsection, nor are they intended as all inclusive lists of the subject matter that is appropriate for the particular subsection.

General Subject Coverage Criteria

General Definitions and Guidelines

Chemistry, as defined by *Chemical Abstracts Service (CAS)*, is both a basic and an applied science that includes the study of:

- matter (atoms, molecules, and subatomic particles; elements and compounds; rocks and minerals; mixtures and multiphase or composite materials such as plastics, ceramics, and concrete);
- its occurrence, composition, preparation, structure, and properties;
- its chemical reactions and changes of state and the laws that govern them;
- its detection and determination;
- its technology and uses;
- and apparatus designed specifically for carrying out such studies and measurements.

Chemical principles, laws, and methods interrelate in one way or another with essentially every other branch of science and technology. These interrelationships create the complex problems of document selection and placement of abstracts of the literature of chemistry and chemical engineering in the 80 specialized sections.

Topics in physics or biology per se are not within the purview of *CA*. However, borderlines that were once perceived to exist between chemistry and physics or between chemistry and biology or medicine can no longer be sharply distinguished. Boundaries have fused into zones of overlapping interest, as in the many aspects of materials science.

One purpose of this manual is to provide an interpretation of the definitions of chemistry and chemical engineering, thereby delineating the subject content of *CA*. With this purpose in view, the following very general criteria are employed for subject selection:

I. Occurrence of matter

A. Natural

1. Mineralogical
2. Geochemical
3. Biochemical

B. Experimental

1. Detection (e.g., from radioactivity or by sonic logging)
2. Demonstration by experimental means (e.g., by spectrometry or diffractometry)

For example:

Isolation and characterization of lemmatoxin
Presence of lipids in mitochondria, blood, or liver tissue
Presence of transuranium elements during bombardment of uranium-238
Mineralogy of lunar dust samples
Deposits of copper ores

II. Reactions and preparation of matter

General Subject Coverage Criteria

- A. Synthesis
- B. Characterization
- C. Mechanisms and kinetics of reactions
- D. Degradation and Stability

For example:

Asymmetric synthesis of aspicilin
Production of antibiotics by bacterial fermentation
Biosynthesis of DNA from nucleotides
Kinetics and mechanism of exchange and substitution reactions of metal carbonyls
Pyrolysis of tetrafluoroethylene
Corrosive effects of acids on aluminum alloys

III. Interactions of energy with matter; interconversion of mass and energy

For example:

Electron-positron annihilation
Cross-sections for photoneutron production in cobalt and nickel
Effects of ionizing radiations on photographic materials
Magnetostriction of rare earth garnet ferrites at low temperature
Laser-induced thermionic emission from tantalum
Ultrasonic dispersion of pigments in water-based paints
Green electroluminescence from zinc sulfide-copper gallium sulfide heterodiodes

IV. Properties of matter

- A. Physical properties related to chemistry

For example:

Temperature dependence of the reflectivity of metals
Ultrasonic pulse method for testing ferromagnetic wires
Shock tube studies of the vapor-liquid condensation process
Effect of B₂O₃ on the color of copper ruby glass
Crystal and molecular structures of natural products
Microstructure of steels
Surface tensions of nonionic surfactant solutions
Specific heats and densities of normal alkanes
Phase equilibrium in the citric acid-cyclohexanone-water system

- B. Chemical, biochemical and nuclear properties

For example:

Reactivity of polyfluorinated fluorosulfato carbinols
Electrochemical properties of metal hydrides
Analysis of mixtures of hydroxy compounds
The ¹⁶⁷Lu → ¹⁶⁷Yb → ¹⁶⁷Tm decay chain
Moessbauer studies of chemical bonding
Effects of reserpine and adrenolytic agents on the pulmonary response to serotonin
Acid-base method for analyzing diethylenetriamine-hydrazine mixtures

V. Uses of chemicals

For example:

- Pharmaceuticals
- Agricultural chemicals
- Ion-exchange resins
- Dyes
- Detergents
- Fuels
- Optical, photographic, printing and recording materials
- Electronic materials

VI. Chemical engineering and industrial chemistry

For example:

- Bioreactors and fermentation apparatus
- New processes and apparatus for petroleum refining
- Manufacture of industrial chemicals
- Manufacture and treatment of alloys and ceramics
- Mass transfer in filtration in porous media
- Apparatus for determination of pore size by a bubble method
- Engineering in environmental chemistry
- Waste treatment and disposal
- (See further discussion below.)

VII. Computer techniques, hardware and software applied to chemical theory and processing, education, documentation, and information

For example:

- Analysis of physical data
- Organization of large collections of chemical structures for computerized searching
- Molecular modeling
- Modeling of dehydration of a suspension in a fluidized-bed unit

VIII. History of chemistry and chemical education

For example:

- Developmental history of the periodic system of elements
- Carl Djerassi named Priestley Medalist
- The voltaic pile: a stimulating general chemistry experiment

Chemical Engineering

The engineering of chemical processes is covered in *CA*. This includes processes for the manufacture and treatment of chemical substances, such as pharmaceuticals, agrochemicals, plastics and rubbers, alloys, ceramics and glasses, other types of building materials, fuels, and wastes.

New types of apparatus and plant equipment designed for use in chemical laboratories and the chemical industry are also covered.

Some general engineering classifications not covered are the following:

Mechanical and industrial engineering without explicit relation to chemical engineering. Design and construction of laboratory instruments (e.g., meters, microscopes, interferometers, light sources, etc.), unless explicitly intended for use in chemical experimentation.

Mechanical alterations to furnaces, reactors and other laboratory and industrial equipment without direct association with processes and properties involving materials.

Mechanical working of materials (e.g., by bending, forming, molding, extrusion, lamination) if not directly related to processing or properties of chemicals.

Economics and Business-Related Subject Coverage

Certain articles concerned with economics and business are selected for *CA* provided that all of the following criteria are met:

1. The article deals with the economic aspects of chemistry as specifically defined in the various individual section descriptions;
2. The article relates directly to the industrial production of chemical substances (in terms of starting materials, intermediates, byproducts, or end products);
3. And the article is attributed to an author, independent of the publication's own editorial staff. (Cf. reference to anonymous articles below.)

Examples:

Articles on economics relating to the production of chemicals for and chemical processes and equipment used in the automotive tire industry are candidates for inclusion. If, however, such articles deal only with the manufacture of tires and/or their means of distribution, marketing, sales, consumption, and uses, without any explicit chemical orientation, they are not selected.

Articles dealing with mining and petroleum exploration, or with the potential for commercialization of alternative energy sources are selected only if there is information explicitly concerned with chemistry or chemical engineering.

Suitable abstracts in this area are placed into the *CA* sections appropriate for the substances or processes concerned.

General Rules for Exclusion from Coverage in *CA*

The subject content of *CA* has by definition a chemical orientation. This orientation is the chief criterion for citation of the scientific and technological literature in *CA*. But because of the fundamental nature of the science of chemistry and of

its pervasiveness throughout so much of science and technology, it is helpful, perhaps simpler, to state the exclusions. Following are some general guidelines for types of information not covered in *CA*:

- Anonymous articles. Exceptions include *Federal Register* items, IUPAC reports, ANSI standards, certain items from *Chemical and Engineering News*, and other items at the discretion of the Editor of *CA*.
- Trivial polemics: argumentative documents without reference or supportive experimental data.
- Reviews that, in the opinion of the document analyst, do not make significant contributions to chemistry or are without bibliographic value.
- Mechanical equipment design. (Cf. section on *Chemical Engineering* above.)
- Chemical price lists, marketing data, cost comparisons, and general ephemeral economic studies not associated with any particular aspects of chemical technology. (Cf. section on Economics and Business-Related Subject Coverage above.)
- Progress or interim reports of government-sponsored research published as separate reports.
- Formulations without identification of a specific component for a specific purpose or in which no synergism occurs.
- Proposals for research work.

In addition, many of the section descriptions bear notations about particular subject areas that are excluded from coverage.

Section 1: Pharmacology

A. Coverage in This Section

1. Biochemical, physiological, behavioral, and toxic effects of drugs or potential drugs, their synthesis, metabolism, analysis in biological systems, and structure-activity relations. (See B.1-3, B.8, B.11, B.16, B.20, B.24, B.25, C.3)
2. Clinical studies reporting drug efficacy, toxicity, or interactions (e.g., synergism, antagonism), or an unexpected drug effect. (See B.4)
3. Pharmacological studies on drugs of abuse. (See B.3, B.6, B.20)
4. Effects of naturally occurring biochemical substances, such as enzymes and heparin, when the substance is used as a drug. (See B.12, B.18, B.22)
5. Pharmacology of blood substitutes and plasma expanders. (See B.7)
6. Biological activity and toxicity of pharmaceutical excipients and carriers. (See B.8)
7. Therapeutic use of immunomodulators (immunosuppressants, immunostimulants, etc.), immune adjuvants, and interferon inducers. (See B.5, B.22)
8. Pharmacological studies on fluoride or other agents for prophylactic or therapeutic dental purposes. (See B.19, B.23)
9. Nonnutritional, therapeutic use of vitamins, vitamin derivatives and analogs, and other nutrients. (See B.1, B.18)
10. Therapeutic use of physiological solutions. (See B.18)
11. Gene therapy either by artificial introduction of exogenous nucleic acid or manipulation of the genome to correct a given disorder. (See B.8, B.25, C.2)
12. Effects of drugs on the genome when the interest is in the drug. (See B.9)
13. Pharmacology of diagnostic agents. (See B.14, B.15)
14. In vivo studies on antimicrobials. (See B.10)

B. Alternative Placement and Exclusion from Coverage in CA

1. Addition of agents, including antibiotics, to animal diets, to promote animal growth or to improve derived products (e.g., egg or wool production): Section 18: "Animal Nutrition".
2. Analysis of drugs in pure form or in tablets, ampuls, and other pharmaceutical preparations (no biological system): Section 64: "Pharmaceutical Analysis".
3. Analytical studies on drugs of abuse: Section 4: "Toxicology".
4. Antidotes to non-drug-related poisoning: Section 4: "Toxicology".
5. Antiserums and vaccines: Section 15: "Immunochemistry".
6. Biological effects of ethanol: Section 4: "Toxicology".
7. Chemical substances used for the preservation of mammalian blood or other body fluids: Section 13: "Mammalian Biochemistry".
8. Drug-formulation, purification, bioavailability, and drug targeting studies where the interest is in drug purification, formulation, or delivery to a body site: Section 63: "Pharmaceuticals".
9. Drugs used only as investigative or diagnostic tools: Section appropriate to the biological organism or process under investigation.
10. In vitro antimicrobial sensitivity tests: Section 10: "Microbial, Algal, and Fungal Biochemistry"; methodology of antimicrobial sensitivity tests: Section 9: "Biochemical Methods".
11. Pharmacology of contraceptives, abortifacients, labor-inducing agents, and fertility agents: Section 2: "Mammalian Hormones".

12. Pharmacology of hormones, enzymes with hormone activity, endocrine products, prostaglandins, leukotrienes, thromboxanes, and naturally occurring neurohormones (neurotransmitters) (e.g., acetylcholine, adrenaline, noradrenaline, dopamine, serotonin, histamine, and γ -aminobutyric acid): Section 2: "Mammalian Hormones".
13. All aspects (including biological effects, therapeutic use, and toxicity/biocompatibility) of life-maintaining devices and prosthetics: Section 63: "Pharmaceuticals".
14. Radiocontrast media, scintigraphy agents and other radioemitting agents, radiomimetics, radioprotectants, and radiosensitizers: Section 8: "Radiation Biochemistry".
15. Use of agents solely for diagnosis, including reagents used for diagnostic assays, other than those listed in B.14:
Section 2: "Mammalian Hormones"
Section 3: "Biochemical Genetics"
Section 7: "Enzymes"
Section 9: "Biochemical Methods"
Section 15: "Immunochemistry"
16. Studies emphasizing the chemical synthesis of drugs including nonindustrial syntheses using enzymes or molecular structure elucidation of drugs: Appropriate organic chemistry section or Section 78: "Inorganic Chemicals and Reactions" for inorganic chemicals and syntheses. (See C.1)
17. Therapeutic use of hyperbaric oxygen: Section 14: "Mammalian Pathological Biochemistry". Toxicity studies on hyperbaric oxygen: Section 4: "Toxicology".
18. Therapeutic nutrition using vitamins, vitamin derivatives and analogs, and other nutrients: Section 18: "Animal Nutrition".
19. Toxic effects of fluoride in water supplies or natural waters: Section 4: "Toxicology"
20. Toxicity studies on drugs when the interest is clearly forensic, e.g., accidental overdose or suicide: Section 4: "Toxicology".
21. Veterinary pesticides applied externally and defleecing agents: Section 5: "Agrochemical Bioregulators".
22. Therapeutic use of interferon and other endogenously occurring immune mediators: Section 15: "Immunochemistry".
23. Dental materials: Section 63: "Pharmaceuticals".
24. Production of drugs of commercial interest by genetically engineered cells or organisms, fermentation procedures, or industrial production of drugs using enzymes: Section 16: "Fermentation and Bioindustrial Chemistry".
25. Novel genetic methods including methods such as nucleic acid sequencing, molecular cloning, nucleic acid amplification (e.g., PCR), mutagenesis, gene mapping, hybridization, and introduction of foreign nucleic acid as well as genetic engineering methodology and the application of established methods in the development of genetically engineered organisms: Section 3: "Biochemical Genetics".
26. Excluded from coverage in CA:
 - a. Effects of crude, undefined extracts or mixtures of unknown composition including aqueous or organic extracts which have not been further chemically characterized.
 - b. Pharmacological effect of mineral waters and therapeutic muds on humans or other animals, even if the chemical composition of the water is given.

C. Cross-References

1. B.16 - Section 1: "Pharmacology"
2. A.11 - Section 3: "Biochemical Genetics"
3. A.1 - Studies where the emphasis is in the biological activity and in which synthetic data are also reported: Cross-refer to appropriate organic chemistry section or (Section 78: "Inorganic Chemicals and Reactions")

D. Subsection Arrangement

0. Reviews
1. Methods
 - Analytical
 - New screening methods
2. Drug metabolism
3. Structure-activity
4. Drug interactions and general pharmacology
5. Effects of antimicrobials and parasiticides
6. Effects of neoplasm inhibitors and cytotoxic agents
7. Effects of inflammation inhibitors and immune agents
8. Effects of cardiovascular, hematologic, and renal drugs
9. Effects of gastrointestinal and respiratory drugs
10. Effects of agents for treating metabolic and endocrine disorders
11. Effects of nervous system- and behavior-affecting drugs and neuromuscular agents
12. Other (all agents and effects not otherwise assignable)

Section 2: Mammalian Hormones

A. Coverage in This Section

1. Pharmacology, physiology, toxicology, and synthesis of mammalian hormones, hormone analogs, and hormone-like substances including synthetic steroids with hormone-like activity, sex steroids (androstanes, estranes, and pregnanes), corticosteroids, prostaglandins, leukotrienes, thromboxanes, and naturally occurring neurotransmitters in mammals, mammalian systems, and model nonmammalian systems. (See B.6, B.8, B.9, B.13, B.17, B.18, C.3)
2. Pharmacology of nonmammalian hormones in mammalian systems. (See B.10)
3. Mammalian-hormone structure and characterization (including physicochemical properties and sequences) and structure-activity relations. (See B.11, B.14)
4. Methods for mammalian-hormone determination, isolation, and purification. (See B.4, B.15)
5. Contraceptives (biochemical effects of both chemical and surgical techniques), abortifacients, labor-inducing agents, and fertility agents. (See B)
6. Methodology or comparison of endocrine gland function tests and disease diagnosis based on new diagnostic agents and/or nonroutine or comparative analytical techniques for detecting or determining mammalian hormones. (See B4)
7. Disease therapy with mammalian hormones, hormone analogs, and hormone-like substances. (See B.4)
8. Interactions between mammalian hormones and biological macromolecules.
9. Use of neurotransmitter-neuromodulator agonists or antagonists in the elucidation of the neurophysiology of mammals and nonmammalian test systems. (See B.9)
10. Removal of glands or depletion of hormones to study physiological functions. (See B.4, B.8)
11. Mammalian hormone receptors.
12. Transcription and translation in the expression of mammalian hormones and hormone-like substances. (See B.12)
13. Mammalian hormone interactions in transcription and translation. (See B.12)
14. Hormonal gene therapy either by artificial introduction of exogenous nucleic acid or manipulation of the genome to correct a given disorder. (See B.2, B.4, B.5, C.2)
15. Enzymes with hormonelike activity. (See B.16)
16. Therapeutic or potential therapeutic effects of hormones on immunological processes. (See B.5)

B. Alternative Placement and Exclusion from Coverage in CA

1. Antidiabetic drugs, eicosanoid inhibitors, goitrogens, antihistamines, and anticholesterolemic: Section 1: "Pharmacology"
2. Hormone formulation, when the primary interest is in the formulation: Section 63: "Pharmaceuticals"
3. Hormones including partitioning agents used solely to increase production of commercial animal products such as meat yield, meat quality, milk production, egg production, wool, pelts, etc., regardless of the method of administration: Section 18: "Animal Nutrition"
4. Mammalian hormones in disease pathogenesis:
Section 15: "Immunochemistry" for immunological diseases
Section 18: "Animal Nutrition" for nutritional diseases
Section 14: "Mammalian Pathological Biochemistry" for other diseases
Mammalian hormones in disease diagnosis in which there is no interest in the methodology or comparison of endocrine gland function tests or in the methodology or comparison of hormone determination or detection methods:
Section 15: "Immunochemistry" for immunological diseases

- Section 18: "Animal Nutrition" for nutritional diseases
Section 14: "Mammalian Pathological Biochemistry" for other diseases (See C.1)
5. The role of hormones in the physiology or pathophysiology of immunological processes, including allergy and anaphylaxis: Section 15: "Immunochemistry" (See C.1)
 6. Nonmammalian hormones in nonmammalian systems:
 - a. Agrochemical application: Section 5: "Agrochemical Bioregulators"
 - b. General levels, metabolism, physiology: Section 12: "Nonmammalian Biochemistry"
 7. Plant hormones:
 - a. Agrochemical application: Section 5: "Agrochemical Bioregulators"
 - b. General levels, metabolism, physiology: Section 11: "Plant Biochemistry"
 8. Removal of endocrine glands or depletion of a hormone in a mammal in order to simulate a pathological condition: Section 14: "Mammalian Pathological Biochemistry"
 9. Pharmacological studies of synthetic neurotransmitters and neurotransmitter antagonists: Section 1: "Pharmacology"
 10. Toxicity of nonmammalian hormones to mammals: Section 4: "Toxicology"
 11. Studies reporting the structural elucidation and/or physicochemical properties of mammalian hormonelike substances and hormones (other than protein hormones, which are placed in Section 2) in which isolation procedures are not detailed (i.e., product has been isolated previously from that source) and in which no correlation with biological properties is made: Appropriate organic chemistry section. (See C.1)
 12. Gene structure and mechanism of transcription or gene expression as well as the mechanism of genome replication, recombination, rearrangement, amplification, mutation, reverse transcription, and repair when the interest is in the mechanism: Section 3: "Biochemical Genetics"
 13. Production of hormones of commercial interest by genetically engineered cells or organisms, fermentation procedures, or industrial production of hormones using enzymes: Section 16: "Fermentation and Bioindustrial Chemistry"
 14. Sequences of nucleic acids encoding hormones and hormone receptors, when the hormone and(or) properties are of incidental interest: Section 3: "Biochemical Genetics"
 15. Novel genetic methods including methods such as nucleic acid sequencing, molecular cloning, nucleic acid amplification (e.g. PCR), mutagenesis, gene mapping, hybridization, and introduction of foreign nucleic acid as well as genetic engineering methodology and the application of established methods in the development of genetically engineered organisms: Section 3: "Biochemical Genetics"
 16. Analysis, structure, or enzymic mechanism of hormonelike enzymes: Section 7: "Enzymes"
 17. Nutritional effects on hormone regulation: Section 18: "Animal Nutrition" (See C.1)
 18. Studies emphasizing the chemical synthesis of hormones including nonindustrial syntheses using enzymes: Appropriate organic chemistry section or Section 78: "Inorganic Chemicals and Reactions" for inorganic syntheses. (See C.1)

C. Cross-References

1. B.4, B.5, B.11, B.17, B.18 - Section 2: "Mammalian Hormones"
2. A.14 - Section 3: "Biochemical Genetics"
3. A.1 - Studies where the emphasis is in the biological activity and in which synthetic data are also reported: Cross-refer to appropriate organic chemistry section or Section 78: "Inorganic Chemicals and Reactions"

D. Subsection Arrangement

0. Reviews
1. Methods
 - Analysis
 - Purification
2. Structure and structure-activity relations
3. Contraceptives, abortifacients, and fertility agents
 - surgical procedures
 - intrauterine devices
 - chemical (hormonal and nonhormonal) means of reproduction regulation
4. Corticosteroid, gonadal, and placental hormones
 - activin
 - androgens
 - chorionic gonadotropin
 - decidual luteotropin
 - estrogens
 - folliculostatin
 - inhibin
 - relaxin
 - placental lactogen
 - placental thyrotropin
 - pregnant mare
 - serum gonadotropin
5. Pituitary and hypothalamic hormones
 - anorexigenic peptide
 - colon mitosis inhibitor
 - corticotropin
 - corticotropin-inhibiting peptide
 - corticotropin-like intermediate lobe peptide
 - corticotropin-releasing factor
 - dynorphin
 - endorphin
 - enkephalin
 - fibroblast growth factors
 - FSH
 - FSH-releasing factor
 - kyotorphin
 - LH
 - LH release-inhibiting factor
 - lipotropin
 - melanostatin
 - melanotropin
 - melanotropin-releasing factor
 - menopausal gonadotropin
 - Muellierian inhibiting hormone
 - neoendorphin
 - neokytorphin
 - neuromedin
 - neurotensin
 - oxytocin
 - pituitary adenylate cyclase-activating peptide
 - pro-opiomelanocortin
 - prolactin
 - prolactin-inhibiting factor
 - prolactin-releasing factor
 - somatoliberin
 - somatostatin
 - somatotropin
 - thyrotropin
 - thyrotropin-releasing factor
 - vasopressin
6. Gastrointestinal and pancreatic hormones
 - amylin
 - bombesin
 - caerulein
 - cholecystokinin
 - chromogranin A
 - chymodinin
 - galanin
 - galanin message-associated peptide
 - gastric inhibitory polypeptide
 - gastrin
 - gastrin-releasing peptide
 - gastrone
 - glucagonoid
 - incretin
 - insulin
 - insulinotropin
 - motilin
 - enteroxyntin
 - pancreastatin
 - pancreatic polypeptide
 - PHI
 - PHM
 - proinsulin C-peptide
 - proinsulin connecting peptide

- glicentin
 - glucagon
 - glucagon-related peptide
 - VIP
7. Thyroid, parathyroid, pineal, and thymus hormones
- calcitonin
 - calcitonin gene-related peptide
 - katalcalcin
 - melatonin
 - parathormone
8. Neurotransmitters
- acetylcholine
 - dopamine
 - noradrenaline
 - adrenaline
 - putative neurotransmitters when studied as neurotransmitters, e.g.,
 - glutamate
 - aspartate
 - glycine
 - adenosine
 - taurine
 - excitatory amino acids
9. Prostaglandins, Thromboxanes, and Leukotrienes
10. Other
- angiotensin
 - angiotensinogen
 - antiarrhythmic peptide
 - atrial natriuretic factor
 - bradykinin
 - colony-stimulating factor
 - delta sleep-inducing peptide
 - 1,25-dihydroxyvitamin D3
 - endothelins
 - epidermal growth factor
 - erythropoietin
 - insulin-like growth factor
 - kallikrein
 - some animal growth regulators such as:
 - transforming growth factors
 - blood platelet-derived growth factors
 - multiplication stimulating activity
 - bone morphogenetic proteins
- proinsulin
 - salivary peptide P-C
 - secretin
 - thymic humoral factor
 - thymic serum factor
 - thymosin
 - thymulin
 - GABA
 - substance P
 - histamine
 - serotonin
 - neurokinin
 - neuropeptide K
 - neuropeptide Y
 - ouabain-like factor
 - parotin
 - peptide YY
 - renin
 - satietin
 - somatomedin
 - substance K
 - thrombopoietin
 - natriuretic hormone
 - nerve growth factor

Subsection Hierarchy (most preferred to least preferred):

0 > 1 > 2 > 3 > 4 = 5 = 6 = 7 = 8 = 9 = 10

Subsection placement should reflect the major point of the paper.

Section 3: Biochemical Genetics

A. Coverage in This Section

1. Gene and genome structure (including cDNA as model of genome structure) and organization including sequences. (See B.1, B.2, B.5, B.17, C.1)
2. Genetic mapping including physical mapping, e.g., restriction mapping, where the product sequence is incidental. (See B.1, C.1)
3. Genetic elements, including plasmids, insertion sequences, and transposons, and genetic element interactions where the interest is in the genetic element itself or in the properties of the interaction. (See B.5, B.9)
4. Mechanism of transcription or gene expression when the interest is in the mechanism. (See B.3, B.16, B.17)
5. Mechanism of genome replication, recombination, rearrangement, amplification, mutation, reverse transcription, and repair. (See B.10, B.11)
6. Genetic methods including methods such as nucleic acid sequencing, molecular cloning, nucleic acid amplification (e.g. PCR), mutagenesis, gene mapping, hybridization, and introduction of foreign nucleic acid. (See B.6, B.14)
7. Methods applied to genetic material where the interest is in biochemical genetics. (See B.12, B.18)
8. Genetic engineering including methodology and the application of established methods in the development of genetically engineered organisms. (See B.8, B.13, B.14, C.2)
9. Molecular cloning. (See B.1, B.2, B.13, B.14)

B. Alternative Placement and Exclusion from Coverage in CA

1. All novel protein sequences including those derived from cDNA unless the sequence is incidental to the study:
Section 2: "Mammalian Hormones" for hormones
Section 4: "Toxicology" for toxins
Section 7: "Enzymes" for enzymes (including ribozymes)
Section 15: "Immunochemistry" for endogenous immunological mediators, or
Section 6: "General Biochemistry" for others.
2. Genetics of disease pathogenesis:
Section 11: "Plant Biochemistry" for plants
Section 12: "Nonmammalian Biochemistry" for nonmammals
Section 14: "Mammalian Pathological Biochemistry" for mammals
Section 15: "Immunochemistry" for immunochemical aspects of disease
Section 18: "Animal Nutrition" for diseases resulting from nutritional disorders.
3. Transcription when the interest is in the mRNA or product:
Section 2: "Mammalian Hormones" for hormones
Section 7: "Enzymes" for enzymes in vitro
Section 15: "Immunochemistry" for endogenous immunological mediators
Section 6: "General Biochemistry" organism-specific section for others.
4. Translation:
Section 2: "Mammalian Hormones" for hormones
Section 7: "Enzymes" for enzymes in vitro
Section 15: "Immunochemistry" for endogenous immunological mediators
Section 6: "General Biochemistry" organism-specific section for others.
5. Physicochemical studies of nucleic acids: Section 6: "General Biochemistry"
6. Disease diagnosis where there is no interest in the genetic method:
Section 11: "Plant Biochemistry" for plants

- Section 12: "Nonmammalian Biochemistry" for nonmammals
 - Section 14: "Mammalian Pathological Biochemistry" for mammals
 - Section 15: "Immunochemistry" for immunochemical aspects of disease
 - Section 18: "Animal Nutrition" for diseases resulting from nutritional disorders.
7. Sequences and physicochemical properties of nucleic acids involved in mRNA processing and translation (e.g., tRNA and rRNA): Section 6: "General Biochemistry"
 8. Gene therapy either by artificial introduction of nucleic acid or manipulation of the genome to correct a given disorder:
 - Section 1: "Pharmacology" for drugs
 - Section 2: "Mammalian Hormones" for hormones
 - Section 15: "Immunochemistry" for immune mediators
 - Section 18: "Animal Nutrition" for therapy of nutritional disorders,
 - Section 16: "Fermentation and Bioindustrial Chemistry" for specific therapeutic agents (preparation, formulation, etc.). See C.3.
 9. Ligand interactions with genetic elements where the interest is in the ligand: Section appropriate for the ligand.
 10. Mechanism of immune mediator gene replication, recombination, rearrangement, amplification, mutation, reverse transcription, and repair: Section 15: "Immunochemistry"
 11. Genomic effectors including mutagens where the interest is in the effector:
 - Section 1: "Pharmacology" for drugs
 - Section 2: "Mammalian Hormones" for hormones
 - Section 5: "Agrochemical Bioregulators" for pesticides in target organisms
 - Section 8: "Radiation Biochemistry" for radiation
 - Section 17: "Food and Feed Chemistry" for foods or isolated nonnutrient chemicals of food interest
 - Section 4: "Toxicology" for others.
 12. Synthetic preparation of nucleic acids (except PCR and other amplification methods):
 - Section 33: "Carbohydrates" if the synthesis does not involve a major fermentative or enzymic step
 - Section 16: "Fermentation and Bioindustrial Chemistry" if synthesis involves a major fermentative or industrial enzymic step.
 13. Production of biochemicals of commercial interest by genetically engineered cells or organisms: Section 16: "Fermentation and Bioindustrial Chemistry"
 14. Genetic methodology (cloning, mutagenesis, etc.) used as a tool for characterization of polypeptide structure, function, or metabolism where the method is standard (of no novelty) and incidental to the nongenetic topic of expressed author interest: Appropriate product- or organism-specific section.
 15. Genetics of phenotypic variation including population genetics, protein isoform distribution, breeding, etc.: Organism-specific section.
 16. Informational macromolecules in prebiotic systems or models: Section 6: "General Biochemistry".
 17. Gene function in physiological processes: Appropriate product- or organism-specific section.
 18. Methods applied to genetic material where the interest is not in biochemical genetics: Section 9: "Biochemical Methods"

C. Cross-References

1. A.1 and A.2- All studies of microbial, plant, and animal systems: Cross-refer to appropriate organism-specific section.
2. A.8 - Methods for cloning of genes for potential commercial products: Section 16: "Fermentation and Bioindustrial Chemistry"
3. B.8 - Section 3: "Biochemical Genetics"

D. Subsection Arrangement

0. Reviews
1. Methods
2. Genetic engineering and cloning
3. Gene structure and organization
4. Genomic processes
5. Autonomous or mobile genetic elements
6. Other

Section 4: Toxicology

A. Coverage in This Section

1. Toxicity of chemical substances (chemicals, animal venoms, plant and microbial toxins) to plants, microorganisms, nonmammals, and mammals, even when studied at the subcellular level. (See B.1, B.2, B.4-B.6, B.8, B.12, B.13, B.19-22)
2. Toxicity, metabolism, and contents, in organisms and tissues (except foods), of chemical substances that are actual or potential pollutants of the environment. (See B.1-B.3, B.7, B.16)
3. Chemical agents (antidotes) for combating toxins, venoms, and poisons (e.g., occupational poisoning) of the types described in A.1 and A.2. (See B.20)
4. Forensic and medicolegal chemical studies including analytical studies on drugs of abuse. (See B.4, B.19, C.1)
5. Methods for toxicological analysis. (See B.2, B.3, B.16, C.1)
6. Carcinogenicity, mutagenicity, and teratogenicity of chemical substances. (See B.1, B.2, B.4, B.10-B.13, B.18, B.20, B.22)
7. Toxicity and toxicity-related metabolism of agrochemicals (including residue accumulation) in nontarget organisms. (See B.1-B.3, B.5, B.6, C.2)
8. Biological effects of ethanol (e.g., toxicity, metabolism, etc.).
9. Toxicity studies on tobacco smoke, tobacco-smoke constituents, and tobacco products, including carcinogen analysis. (See C.3)
10. Studies of the deleterious effects of oxygen in greater-than-normal concentrations and/or pressures.
11. Structure and physicochemical properties of proteinaceous toxins and venom components. (See B.9)

B. Alternative Placement and Exclusion from Coverage in CA

1. Toxicology of nutrients:
Section 10: "Microbial, Algal, and Fungal Biochemistry"
Section 18: "Animal Nutrition"
Section 19: "Fertilizers, Soils, and Plant Nutrition"
2. Toxicology of nonnutrient food constituents; effects, determination, and contents of contaminants, additives, and residues; safety evaluation, permissible levels, and tolerance limits; levels of nonnutrient toxic substances in living organisms as a result of ingestion in food: Section 17: "Food and Feed Chemistry"

Note: Author emphasis and other factors (e.g., publication in food-oriented journal) determine whether some systems (e.g., fish in the sea, vegetables in a garden) are to be considered as primarily of food interest or as physiological components of the environment.

3. Levels of herbicide and pesticide residues in soil and agricultural waters, including analysis: Section 5: "Agrochemical Bioregulators"
4. Toxicity and toxicology studies on drugs and drug excipients (except when the primary interest is forensic): Section 1: "Pharmacology"
5. Effects of herbicides and other agricultural pesticides on target organisms: Section 5: "Agrochemical Bioregulators"
6. Effects of herbicides and other agricultural pesticides on nontarget organisms when the interest is primarily agricultural rather than toxic (e.g., improvement of crop growth, yield, or metabolism as a consequence of herbicide application): Section 5: "Agrochemical Bioregulators"

7. Uncontrolled exposure of plants or animals to the products of environmental pollution:
Section 19: "Fertilizers, Soils, and Plant Nutrition"
Section 59: "Air Pollution and Industrial Hygiene"
Section 61: "Water"
8. Toxins in association with microbial infections in plants, nonmammals, or mammals, including the effects of purified toxins, if there is infection-related interest: Appropriate organism-specific section.
9. Studies dealing with the structure of enzymes from venoms and toxins: Section 7: "Enzymes"
10. Virus-induced cell transformation:
Section 10: "Microbial, Algal, and Fungal Biochemistry"
Section 3: "Biochemical Genetics"
Section 14: "Mammalian Pathological Biochemistry"
11. Carcinogens used as investigative tools for studying neoplasia: Section 14: "Mammalian Pathological Biochemistry"
As tools for inducing neoplasia for testing neoplastic drugs: Section 1: "Pharmacology"
12. Toxicology and standards for cosmetics, perfumes, etc., and their active and excipient components: Section 62: "Essential Oils and Cosmetics"
13. Toxicity and toxicological studies on hormones (except when the primary interest is forensic) including toxicity, carcinogenicity, mutagenicity, and teratogenicity: Section 2: "Mammalian Hormones"
14. Physiology of the elaboration of toxins and venoms: Appropriate organism-specific section.
15. Studies in which a toxin is used as a tool for mechanism elucidation: Section appropriate to the biological organism or process under investigation.
16. Distribution, biochemical effects, detection methods, and removal of radioactive fallout if a biological system is involved: Section 8: "Radiation Biochemistry"
17. Toxin interactions with the immune system: Section 15: "Immunochemistry"
18. Effects of chemical mutagens when used as a tool to examine the mechanism of genome replication, recombination, rearrangement, amplification, mutation, reverse transcription and repair: Section 3: "Biochemical Genetics"
19. Pharmacology of drugs of abuse: Section 1: "Pharmacology"
20. All aspects (including biological effects, use for removing drugs or other exogenous toxic substances, as well as toxicity/biocompatibility) of life-maintaining devices and prosthetics: Section 63: "Pharmaceuticals"
21. Phototoxicity studies: Section 8: "Radiation Biochemistry"
22. Carcinogenicity, mutagenicity, and teratogenicity of radiation and radiochemicals: Section 8: "Radiation Biochemistry"

C. Cross-References

1. A.4 - Section 1: "Pharmacology" when data given are of interest to pharmacology.
2. A.7 - Section 5: "Agrochemical Bioregulators" as appropriate.
3. A.9 - Section 11: "Plant Biochemistry" as appropriate.

D. Subsection Arrangement

0. Reviews
1. Methods (including analysis)
2. Forensic chemistry (including analysis)
3. Chemicals (household, industrial, general)
4. Agrochemical
5. Toxins and venoms
6. Carcinogens, mutagens, and teratogens
7. Ethanol and alcoholism
8. Tobacco
9. Other

Section 5: Agrochemical Bioregulators

A. Coverage in This Section

1. Biochemical effects, on target organisms, of bactericides, virucides, fungicides, herbicides, defoliant, insecticides, nematocides, acaricides, molluscicides, algicides, slimicides, rodenticides, and other bioregulators. (See B.5)
2. External application of veterinary pesticides. (See B.4)
3. Studies on the addition of the substances cited in A.1 to such products as lubricants, paints, wood, and adhesives when the emphasis is on the biocidal activity. (See B.7, B.13, C.1)
4. Chemosterilants, insect hormones, pheromones, repellents, and attractants intended for pest control. (See B.9)
5. Metabolism of pesticides in target organisms. (See B.5)
6. Pesticide selectivity and resistance.
7. Methods for detection and determination of pesticides. (See B.2, B.8, B.11, B.12, C.2)
8. Agrochemical and pesticide synthesis or manufacture (including patents) but with emphasis on application, uses, or properties. (See B.1, C.3)
9. Pesticide physical-chemical properties (e.g., soil kinetics, diffusion, and adsorption), as well as pesticide degradation studies.
10. Chemical structure-biological activity relations of pesticides.
11. Pesticide formulation, when the formulation characteristics are correlated with effects on biological activity. (See B.14b)
12. Safening agents and antagonists for pesticides.
13. Studies of agrochemical residues in soil and agricultural waters (e.g., irrigation water, farm ponds), including analysis. (See B.2, B.11, C.4)
14. Agronomically or commercially oriented studies of the biochemical effects, metabolism, utilization, and analysis of synthetic or naturally occurring plant hormones and plant-growth regulators. (See B.6, B.10, B.12)
15. Effects of herbicides and other agricultural pesticides on nontarget organisms when the interest is primarily agricultural rather than in toxicity (e.g., improvement of crop growth, yield, or metabolism as a consequence of herbicide application). (See B.5)
16. Agronomically or commercially oriented studies of pest and herbicide resistance in genetically engineered plants. (See B.6, B.12)

B. Alternative Placement and Exclusion from Coverage in CA

1. Studies emphasizing synthesis or manufacture of pesticides:
Section 16: "Fermentation and Bioindustrial Chemistry" for production of agrochemicals or pesticides by fermentation including those involving genetically engineered organisms or an industrial enzymic step
Appropriate organic chemistry section or Section 78: "Inorganic Chemicals and Reactions" for others. (See C.5)
2. Studies of agrochemicals in or on foods, including regulations, standards, and methods of analysis: Section 17: "Food and Feed Chemistry"
3. Studies of agrochemicals in alcoholic beverages or in materials specifically for alcoholic beverage manufacture: Section 17: "Food and Feed Chemistry"
4. Veterinary pesticides given internally: Section 1: "Pharmacology"
5. Pesticide metabolism in and toxicity to humans or other nontarget organisms not of agricultural significance: Section 4: "Toxicology"

6. Naturally occurring plant hormones or their synthetic analogs, their physiological effects, metabolism, and mode of action, when the emphasis is primarily physiological rather than agrochemical: Section 11: “Plant Biochemistry”
7. General microbial disinfection (sterilization) associated with biochemical or medical technology: Section 10: “Microbial, Algal, and Fungal Biochemistry”
8. Detection and determination of pesticides in nontarget organisms and in forensic cases: Section 4: “Toxicology”
9. Invertebrate hormones, pheromones, allomones, etc., not being studied specifically as pest-control agents: Effects studies - Section 12: “Nonmammalian Biochemistry”
10. Use of plant-growth regulators for production of substances of commercial interest by tissue cultures: Section 16: “Fermentation and Bioindustrial Chemistry”
11. Detection and determination of pesticides as environmental pollutants and pollution by pesticides:
Section 59: “Air Pollution and Industrial Hygiene”
Section 61: “Water”
Section 19: “Fertilizers, Soils, and Plant Nutrition”
12. Novel genetic methods including methods such as nucleic acid sequencing, molecular cloning, nucleic acid amplification (e.g. PCR), mutagenesis, gene mapping, hybridization, and introduction of foreign nucleic acid as well as genetic engineering methodology and the application of established methods in the development of genetically engineered organisms: Section 3: “Biochemical Genetics”
13. Biocidal additives for products such as lubricants, paints, wood, and adhesives when the emphasis is on the material and not the biocidal activity: Appropriate product section.
14. Excluded from coverage in CA:
 - a. Effects of well-known pesticides on usual target organisms where no new chemical data are provided and no synergistic effects among substances are shown.
 - b. Physical or mechanical aspects of pesticide application, such as droplet size or ultralow-volume application, where no correlation is made with effects on biological activity.

C. Cross-References

1. A.3 - Industrial and agricultural pesticides used in or with specific products: Cross-refer to section concerning the product.
2. A.7 -
Section 79: “Inorganic Analytical Chemistry”
Section 80: “Organic Analytical Chemistry”
3. A.8 - Cross-refer to appropriate synthetic organic or inorganic chemistry section.
4. A.13 -
Section 19: “Fertilizers, Soils, and Plant Nutrition” for agrochemicals in soils
Section 61: “Water” for agrochemicals in water.
5. B.1 - Section 5: “Agrochemical Bioregulators”

D. Subsection Arrangement

0. Reviews
1. Methods (including analysis)
2. Microbial
 - Fungicides
 - Bactericides
 - Virucides

3. Plant
 - Herbicides
 - Growth regulators
 - Defoliant
 - Desiccants
4. Invertebrate
 - Insecticides
 - Molluscicides
5. Vertebrate
 - Rodenticides
 - Avicides
6. Other

Section 6: General Biochemistry

A. Coverage in This Section

1. Reviews and symposiums regarded as general biochemistry.
2. Biochemical studies of subcellular processes or their models when the preparations under study are in the subcellular state during the actual process and there is no clear emphasis on the process at the cellular level. This includes subcellular biosynthetic and metabolic processes such as membrane transport, oxidative phosphorylation, protein biosynthesis, mitochondrial respiration, interaction of isolated biomolecules, and electron transport. (See B.1-6, B.9-11, B.17, B.20, B.25, C.2)
3. In vitro interactions between biological macromolecules or subcellular systems and chemical substances that cannot be placed in Sections 1, 2, 3, 4, 5, 7, 15, or 17. (See B.2, B.7-10, B.20, B.26)
4. Biochemical studies of subcellular components (membranes, ribosomes, microsomes, nuclei, mitochondria, etc.) or their models when the interest is in the function of the organelle. (See B.25, C.2)
5. Physicochemical properties (e.g., visible spectra, Moessbauer spectra, conformation, molecular weight, solubility, crystal structure, etc.) of nucleic acids and proteins, even when the physicochemical properties are not correlated with biological properties. (See B.3-8, B.11, B.15, B.16, B.20-23)
6. Physicochemical properties (e.g., visible spectra, Moessbauer spectra, conformation, molecular weight, solubility, crystal structure, etc.) of natural products other than proteins and nucleic acids, (e.g., lipids, carbohydrates) but only when the physicochemical properties are correlated with biological properties. (See B.3-6, B.11, B.13, B.15-23)
7. Studies on amino acid composition (including structural elucidation of amino acids from proteins) and sequence as well as functional groups, crosslinks, oligosaccharide moieties, etc., of natural proteins and peptides. Studies on the base, nucleoside, nucleotide, and functional group composition (including structural elucidation of these constituents) and sequences of certain nucleic acids. (See B.4, B.6-8, B.11, B.20-23)
8. Prebiotic biochemistry on Earth and xenobiochemistry, e.g., speculation as to the possibility of life on other planets or outside the solar system. (See B.7-10, B.24)
9. Comparative biochemical studies involving two or more different classes of organisms (i.e., microorganisms, nonmammals, mammals, plants), including molecular evolution, when the interest is definitely in the comparison. (See B.7-10, B.13, B.17)
10. Nomenclature rules and recommendations (e.g., IUPAC rules) for biological compounds. (See B.11, B.21-23)

B. Alternative Placement and Exclusion from Coverage in CA

1. Studies of normal processes (metabolism of endogenous substances, development, etc.) when the process or interaction is first effected in the organism, tissue or cell (including whole homogenates) and the results are analyzed on a subcellular basis, or when the cellular process is clearly emphasized even though the study is conducted at the subcellular level: Organism-specific section.
2. Effects, metabolism, and interactions of the types of substances in Sections 1, 2, 4, 5, 7, or 15 with biological macromolecules or subcellular systems except when used as tools or models for more general systems:

Section 1: "Pharmacology"	Section 5: "Agrochemical Bioregulators"
Section 2: "Mammalian Hormones"	Section 7: "Enzymes"
Section 4: "Toxicology"	Section 15: "Immunochemistry"

3. Studies on diseases, when the interest is in the pathological state, even if the study is done on a subcellular system or isolated compound (e.g., hemoglobin S): Organism-specific section
Section 11: "Plant Biochemistry"
Section 12: "Nonmammalian Biochemistry"
Section 14: "Mammalian Pathological Biochemistry"
4. Changes in structure, properties, etc., of cell constituents or changes in subcellular processes as a result of viral infection, transfection, or transformation: Appropriate organism-specific section if the emphasis is on the host, Section 10: "Microbial, Algal, and Fungal Biochemistry" if the emphasis is on the virus.
5. Subcellular photosynthesis studies and studies on components concerned with photosynthesis or photophosphorylation, such as chlorophylls and quinones: Section 11: "Plant Biochemistry"
6. Blood composition or coagulation studies: Section 13: "Mammalian Biochemistry"
Exception: Structure or property studies of proteins, e.g., fibrin or hemoglobin, are placed in Section 6 if the emphasis is not on clotting or other physiological aspects.
7. Gene and genome structure and organization and genetic mapping: Section 3: "Biochemical Genetics"
8. Informational nucleic acid sequences when the protein product is of incidental interest: Section 3: "Biochemical Genetics"
9. Genetic element interactions where the interest is in the genetic element itself or in the properties of the interaction: Section 3: "Biochemical Genetics"
10. Mechanisms of genome replication, recombination, rearrangement, amplification, mutation, reverse transcription, and repair: Section 3: "Biochemical Genetics"
11. Immunochemical studies (even at a subcellular level), including structure and physicochemical properties of immunological substances: Section 15: "Immunochemistry"
12. Effects of low- or high-energy electromagnetic (including visible light) and corpuscular radiation on subcellular systems or macromolecules other than those involved in vision or physiological photoperiodicity: Section 8: "Radiation Biochemistry"
Photosynthesis: Section 11: "Plant Biochemistry"
13. Studies of natural products other than nucleic acids and proteins:
Such sections as organism-specific sections, organic chemistry sections,
Section 2: "Mammalian Hormones"
Section 15: "Immunochemistry"
Section 17: "Food and Feed Chemistry"
14. Chemical syntheses of organic compounds: Appropriate organic chemistry section if synthesis does not involve a major fermentative or industrial enzymic step (See C.1); Section 16: "Fermentation and Bioindustrial Chemistry" if synthesis involves a major fermentative or industrial enzymic step.
15. Composition studies of subcellular components when the primary interest is in the uniqueness of the subcellular component from a particular organism (e.g., the first characterization or localization of such a compound in that organism): Organism-specific section.
16. General methods for the isolation and purification of biochemical substances: Section 9: "Biochemical Methods"
Genetic methods: Section 3: "Biochemical Genetics"
17. Crystallization, nucleation, or dissolution of inorganic salts (e.g., calcium phosphate) when the emphasis is on biochemistry: Appropriate organism-specific section, e.g., Section 13: "Mammalian Biochemistry"
For tooth studies: Section 14: "Mammalian Pathological Biochemistry" for biliary calculus studies. Studies where the emphasis is not biochemistry: Section appropriate for the process, e.g., Section 75: "Crystallography and Liquid Crystals" for crystallization of calcium phosphate.
18. Novel chemical methods for taxonomic classification: Section 9: "Biochemical Methods"

19. Effects of chemical mutagens and other genetic effectors:
When interest is in the process:
Section 3: "Biochemical Genetics"
When interest is in the effector:
Section 1: "Pharmacology" for drugs
Section 2: "Mammalian Hormones" for hormones
Section 5: "Agrochemical Bioregulators" for pesticides in target organisms
Section 8: "Radiation Biochemistry" for radiation
Section 17: "Food and Feed Chemistry" for foods or isolated nonnutrient chemicals of food interest
Section 4: "Toxicology" for others
20. Chemistry of food and model systems of food (e.g., gliadin physicochemical properties, browning reaction in relation to foods and food processing): Section 17: "Food and Feed Chemistry"
21. Structure and properties of mammalian hormones and their receptors: Section 2: "Mammalian Hormones"
22. Structure and properties of enzymes (including ribozymes): Section 7: "Enzymes"
23. Structure and physicochemical properties of proteinaceous toxins and venom components: Section 4: "Toxicology"
24. Chemical methods for detecting the presence of living organisms: Section 9: "Biochemical Methods"
25. Studies of biochemical substances normally placed in Section 6 and not more appropriately placed in other biochemistry sections which emphasize synthesis: Appropriate organic chemistry section or Section 78: "Inorganic Chemicals and Reactions". (See C.1)
26. Physiological interactions of blood coagulation factors with each other and with other chemical substances normally found in the circulatory system both in vitro and in vivo: Section 71: "Nuclear Technology"

C. Cross-References

1. B.14, B.25 - Section 6: "General Biochemistry"
2. A.2, A.4 - Cross-refer to appropriate organic or inorganic chemistry section for organic or inorganic chemicals used as biochemical models.

D. Subsection Arrangement

0. Reviews
1. Subcellular processes
2. Nucleic acids and their constituents
 - Nucleosides and nucleotides from nucleic acids
 - Nucleic acid bases
3. Proteins and their constituents
 - Amino acids from proteins
 - Peptides
 - Glycoproteins, phosphoproteins, hemoproteins, metalloproteins, etc.
 - Chromatin
4. Carbohydrates
 - Protein-associated carbohydrates
5. Lipids
6. Membranes
 - Biomembrane models
7. Other

Section 7: Enzymes

A. Coverage in This Section

1. Reviews on the isolation, purification, characterization, structure, reaction mechanism, and immobilization of enzymes and coenzymes.
2. Nonroutine and comparative analytical techniques for detecting and determining enzymes, even if for disease diagnosis or if done on nonsubcellular systems. (See B.1, B.14, B.15)
3. General biochemical studies of enzymes and enzyme-like systems (which hereafter will also include ribozymes and catalytic antibodies) in a purified state, in cell-free extracts, or in isolated subcellular systems. (See B.20, B.21). These include:
 - a. Isolation and purification procedures
 - b. General characterization and properties (e.g., temperature and pH optimums, K_m and V_{max} , molecular weight)
 - c. Substrate and cofactor specificity
 - d. Inhibition, activation and regulation (See B.11)
 - e. Kinetics and mechanism of action
 - f. Structure (e.g., sequence, conformation, x-ray analysis) (See B.17)
 - g. Active-site studies
 - h. Subcellular biosynthesis (See B.3, B.7, B.16)
 - i. Enzyme and coenzyme models (See B.19, C.1)
 - j. Enzyme heterogeneity, isoenzymes, multiple forms, etc. (See B.12)
4. Coenzymes, apoenzymes, inhibitors, substrates, and products of reaction when studied in a purified state, in cell-free extracts, or in isolated subcellular systems.
5. Methods for immobilization (insolubilization) of enzymes and coenzymes, general applications and uses of immobilized enzymes and coenzymes, and studies done on immobilized enzymes (including use and performance in biocatalytic reactors) where the interest is in the characterization of the enzyme itself and/or the mechanism of immobilization. Included are studies of immobilization of microbial cells or organelles, when they are being used as an enzyme source for immobilization studies. (See B.5)
6. Structure studies on protein inhibitors (e.g., proteinase inhibitors, trypsin inhibitors) or activators of enzymes, when such studies are done in the context of their enzyme-related function.
7. Studies which use known drugs or hormones as means to activate or inhibit enzymes, when the emphasis is on elucidating the mechanism of action or some other characteristic of the enzyme. (See B.2, B.4)
8. Synthesis of enzyme inhibitors, activators, and substrates when the emphasis is on the function. (See B.19, C.1)

B. Alternative Placement and Exclusion from Coverage in CA

1. Determinations of tissue enzyme levels in which there is no interest in the methodology or comparison of enzyme determination or detection methods: Sections covering the type of tissue involved. Enzymes in disease diagnosis in which there is no interest in the methodology or comparison of enzyme determination or detection methods:
 - Section 11: "Plant Biochemistry" for plant diseases
 - Section 12: "Nonmammalian Biochemistry" for nonmammalian diseases
 - Section 14: "Mammalian Pathological Biochemistry" for mammalian diseases
 - Section 15: "Immunochemistry" for immunological diseases
 - Section 18: "Animal Nutrition" for nutritional diseases
2. Studies on the regulation of amounts of enzyme active under certain conditions (circadian rhythm, response to stress (heat, cold, exercise, etc.)), where the interest is in the condition: Appropriate organism-related section.

3. Studies dealing with physiological induction or repression mechanisms of enzyme biosynthesis, when carried out *in vivo* or at the cellular level (e.g., catabolite repression in bacteria): Appropriate organism-related section.
4. Enzyme regulation by drugs and hormones, when the interest is in the mechanism of action of the drug or hormone:
Section 1: "Pharmacology"
Section 2: "Mammalian Hormones" respectively.
5. Immobilized enzyme systems with commercial fermentation interest clearly indicated and when the primary interest is in the production of product and not in the study of the enzyme as such: Section 16: "Fermentation and Bioindustrial Chemistry"
If the indicated interest is in the use of the enzyme in other technological systems: Section appropriate to the process or product involved.
6. Enzymes used analytically to determine other substances: Section 9: "Biochemical Methods" or sections appropriate to the type of determination involved.
7. Studies of the biochemistry of enzymes, coenzymes, inhibitors, etc., which are carried out at the cellular level or above (including whole homogenates): Appropriate section covering the organism under investigation.
Subcellular enzyme biochemistry in relation to a more diffuse subcellular metabolic process, such as membrane permeability, active transport, and oxidative phosphorylation: Section 6: "General Biochemistry"
8. Effects of enzymes administered at physiological levels to an organism: Appropriate organism-related section.
9. Enzymes used pharmacologically: Section 1: "Pharmacology"
10. Pathological biochemical studies involving enzymes in mammals (defects, abnormal levels, mutations causing disease, etc.), even if carried out in subcellular systems: Section 14: "Mammalian Pathological Biochemistry"
11. Physiological interactions of blood coagulation factors with each other and with other chemical substances normally found in the circulatory system both *in vitro* and *in vivo*: Section 13: "Mammalian Biochemistry"
12. Studies on enzyme heterogeneity, multiple forms, isoenzymes, etc., where interest is primarily in the organism, especially classical genetics and development: Appropriate organism-related section.
13. Effects of low- and high-energy electromagnetic (including visible light) or corpuscular radiation on enzymes: Section 8: "Radiation Biochemistry"
Enzymes in photosynthesis: Section 11: "Plant Biochemistry"
14. Determination of enzymes in food and feeds or in alcoholic beverages: Section 17: "Food and Feed Chemistry"
15. Determination of enzymes in soils: Section 19: "Fertilizers, Soils, and Plant Nutrition"
16. Studies of the mechanism of transcription or gene expression, when the interest is in the mechanism: Section 3: "Biochemical Genetics"
17. Sequences of nucleic acids encoding enzymes, when enzyme sequence and/or properties are of incidental interest: Section 3: "Biochemical Genetics"
18. Enzymes with hormone-like activity when the interest is in the hormone activity rather than the enzyme structure, enzyme analysis, or enzymic mechanism: Section 2: "Mammalian Hormones"
19. Nonindustrial chemical syntheses of organic compounds involving an enzymic step: Appropriate organic chemistry section. (See C.2); Industrial syntheses of organic compounds involving an enzymic step and syntheses by genetically engineered organisms: Section 16: "Fermentation and Bioindustrial Chemistry"
20. Studies of ribozyme-containing RNA molecules in which there is no interest in the ribozyme itself:
Section 3: "Biochemical Genetics"
Section 6: "General Biochemistry", or appropriate section for the RNA molecule of interest.
21. Applications of catalytic antibodies: see the appropriate section (e.g., catalytic antibodies used therapeutically: Section 1: "Pharmacology"; catalytic antibodies used in synthetic preparations of organic compounds: appropriate organic chemistry section; catalytic antibodies used in immunoassays: Section 9: "Biochemical Methods")

C. Cross-References

1. A.8 - Cross-refer to appropriate organic chemistry section.
2. B.19 - Section 7: "Enzymes"

D. Subsection Arrangement

0. Reviews
1. Analysis (determination-detection)
2. Separation-purification-general characterization
3. Substrate-cofactors-inhibitors-activators-coenzyme-products
4. Kinetics-mechanism-enzyme and coenzyme models
5. Structure-conformation-active site
6. Subcellular biosynthesis
7. Immobilized enzymes-immobilized coenzymes-enzyme reactors
8. Other

Section 8: Radiation Biochemistry

A. Coverage in This Section

1. Chemical effects of high-energy (α - and β -particles, γ - and x-rays, protons, neutrons) and low-energy (UV, visible, including lasers, and IR), electromagnetic and/or corpuscular radiation on mammals, nonmammals, plants, microorganisms, or their tissues, organs, cells, subcellular components, or their chemical constituents (e.g., nucleic acids, amino acids, proteins, lipids, carbohydrates, enzymes, hormones, and alkaloids) when of interest to biological systems. (See B.1, B.2, B.7, B.8, B.11, B.15b)
2. Studies (including pharmacological studies and synthesis) with radioprotectants, radiomimetics, radiosensitizers, and agents which modify radiation effects. (See B.12, B.15a, C.4)
3. Studies (including analysis) of radioisotopes (including natural radionuclides, radioactive fallout, radioactive wastes) in a biological system (e.g., milk, food, pasture, herbage, soil, animal, agrochemical systems). (See B.3, B.9, B.10, B.15a, C.1)
4. Distribution, metabolism, biochemical effects of radioisotopes (including radioactive fallout), and illness caused by ionizing radiation when studied at the molecular or biochemical level. (See B.8, B.15b)
5. Chemical studies emphasizing radiation in disease diagnosis or therapy (including application of radiation at therapeutic levels). (See B.4, B.15a, C.2)
6. Imaging and radiation monitoring methods for biological systems (e.g., ESR, NMR, and fluorescent imaging, scintigraphy, radiography, tomography). (See B.8, B.10, B.14, B.15)
7. Metabolism, determination, pharmacodynamics, toxicity, synthesis, and diagnostic uses of imaging agents. (See B.3, B.5, B.12, B.15a, C.4)
8. Studies emphasizing the radiolabeling of biopolymers, biological macromolecular compounds, and biological and anatomical entities (e.g., liposomes, erythrocytes, blood platelets, lysosomes) for potential use in imaging or radiotherapy. (See B.5)
9. Biological studies of sunscreens and suntanning agents, e.g., toxicity, protection against or enhancement of UV or light effects in a biological system. (See B.13)
10. Phototoxicity studies. (See C.3)
11. Genomic effects of radiation. (See B.7)

B. Alternative Placement and Exclusion from Coverage in CA

1. Chemical effects of light in the process of vision or in photoperiodicity phenomena: Organism-specific section.
2. Chemical effects of light in photosynthesis: Section 11: "Plant Biochemistry"
3. Determination of radiocontrast media and other imaging agents in pure form or in formulations: Section 64: "Pharmaceutical Analysis"
4. Development of equipment and technology for application in radiotherapy: Section 71: "Nuclear Technology"
5. Formulation of radiopharmaceuticals, radiocontrast media and other imaging agents: Section 63: "Pharmaceuticals"
6. Health physics studies dealing with radiation protection of personnel, including development and use of equipment for detecting, producing, or altering radiations or radionuclides (e.g., shielding, dosimeters, phantoms, models, and devices for monitoring radiation levels): Section 71: "Nuclear Technology"

7. Radiation effects on the mechanism of transcription or gene expression: Section 3: "Biochemical Genetics"
Radiation effects on the mechanism of genome replication, recombination, rearrangement, amplification, mutation, reverse transcription, and repair when there is no specific interest in the radiation: Section 3: "Biochemical Genetics"
8. Radiation used as an investigative tool (e.g., in the production of bacterial mutants, food preservation, or in following a metabolic pathway with isotopically labeled compounds): Specific sections pertaining to the subject studied.
9. Radioactive fallout studies not involving biological systems (e.g., weather effects on fallout distribution): Section 59: "Air Pollution and Industrial Hygiene"
10. Radiochemical analysis and spectrochemical analysis of general biochemical interest: Section 9: "Biochemical Methods"
11. Radiation used only as a heat source (e.g., infrared radiation): Appropriate organism-specific section.
12. Studies emphasizing the synthesis of radiopharmaceuticals, radiosensitizers, radioprotectants, radiomimetics and imaging agents, in the absence of formulation: Section 71: "Nuclear Technology" if emphasis is on nuclear reactions. Appropriate organic chemistry section or Section 78: "Inorganic Chemicals and Reactions" for others. (See C.5)
13. Formulation, compounding, and concomitant biological testing of sunscreens and suntanning agents: Section 62: "Essential Oils and Cosmetics"
14. Sonography, ultrasonography, echocardiography, and other imaging procedures for biological systems that do not use radiation monitoring: Section 9: "Biochemical Methods"
Imaging, imaging procedures, imaging agents, and imaging methods other than for biological systems: Section appropriate for the material or methodology.
15. Excluded from coverage in CA: Morphological, anatomical, and histological effects of ionizing radiation.

C. Cross-References

1. A.3 - Cross-refer to appropriate section:
Section 17: "Food and Feed Chemistry"
Section 19: "Fertilizers, Soils, and Plant Nutrition"
2. A.5 - Section 14: "Mammalian Pathological Biochemistry"
3. A.10 - Section 4: "Toxicology"
4. A.2, A.7 - Studies where the emphasis is biological activity in which synthetic data is also reported:
Section 71: "Nuclear Technology" if the preparation is by nuclear reactions; appropriate organic chemistry section or
Section 78: "Inorganic Chemicals and Reactions" for others.
5. B.12 - Section 8: "Radiation Biochemistry"

D. Subsection Arrangement

0. Reviews
1. Methods (including analysis)
2. Biochemical Substances
3. Microorganisms
4. Plants
5. Nonmammals
6. Mammals
7. Humans
8. Fallout
9. Disease diagnosis and therapy
10. Other

Section 9: Biochemical Methods

A. Coverage in This Section

1. Methods for determinations, detections, and identifications (including preparatory procedures, apparatus, reagents) with stated biochemical interest or of substances in biological systems. (See B.1, B.23, B.24-26, C.4)
2. Laboratory methods and procedures for separation, isolation, and purification of chemical components of organisms, unless the major interest is in the properties, composition, or physiological significance of the component.
3. Analytical and preparative methods for plant and nonmammalian hormones, unless of agrochemical or commercial interest. (See B.1, C.1)
4. Chemical procedures and techniques for the development and initial characterization of cell lines (including those for cell line immortalization), and for preparing and maintaining plant and animal subcellular components, cell or tissue cultures, or organs, when the emphasis is on the method. (See B.6-B.9, B.26c)
5. Labeling of compounds of biological interest by exchange reactions or by simple synthetic procedures with tracers (radioactive or stable isotopes). (See B.1, B.13)
6. Methods and reagents for cytochemical and histochemical determination, detection, and identification of chemical components of cells or tissue. (See B.1, B.26b)
7. Novel methods for determining the molecular weight, conformation, and configuration of biopolymers. (See B.1, B.17, B.18)
8. Methodology or comparison of organ (nonendocrine) function tests and disease diagnosis based on new diagnostic agents and/or nonroutine or comparative analytical techniques for detecting or determining chemical substances. (See B.2-5, C.2)
9. Chemical methods for detecting the presence of living organisms. (See B.11)
10. Apparatus and chemical technology associated with nonprosthetic life-support systems (e.g., atmospheric regeneration in space vehicles). (See B.9)
11. Novel chemical methods for taxonomic classification employing a comparison of various species of organisms. (See B.12, B.15)
12. Methods for determining blood-clotting factors. (See B.19)
13. Methods for the determination of the in vitro effects of antimicrobials on microorganisms.
14. Diagnostic agents, including reagents used for diagnostic assays. (See B.1-5, B.20)
15. Sonography, ultrasonography, echocardiography, and other imaging procedures that do not use radiation monitoring when used for biological systems. (See B.21)
16. Analysis of biopolymers (proteins, nucleic acids, and polysaccharides). (See B.1, B.23)
17. Analytical methods applicable to more than two biochemical sections which normally include analytical methods. (See B.25)

B. Alternative Placement and Exclusion from Coverage in CA

1. Analytical and/or preparative procedures and apparatus specifically of interest in the fields of pharmacology, biochemical genetics, toxicology, forensic science, plant-growth regulators, herbicides, pesticides, mammalian hormones and mammalian hormone receptors, enzymes, radiation biochemistry, tobacco, immunochemistry, fermentations, food, plant nutrition, soils, fertilizers, chemical education, archaeology, and pharmaceuticals: Specific sections covering these areas.

2. Disease diagnosis based on nonroutine or comparative methods for detecting or determining:
 - Mammalian hormones: Section 2: "Mammalian Hormones"
 - Enzymes: Section 7: "Enzymes"
 - Immunochemicals: Section 15: "Immunochemistry" (See C.2)
3. Disease diagnosis based on nonroutine or comparative genetic methods: Section 3: "Biochemical Genetics" (See C.3)
4. Methodology or comparison of endocrine-gland function tests: Section 2: "Mammalian Hormones"
5. Disease diagnosis in which there is no interest in the methodology or comparison of organ function tests or in the methodology or comparison of chemical determination or detection methods:
 - Section 11: "Plant Biochemistry" for plant diseases
 - Section 12: "Nonmammalian Biochemistry" for nonmammalian diseases
 - Section 14: "Mammalian Pathological Biochemistry" for mammalian diseases
 - Section 15: "Immunochemistry" for immunological diseases
 - Section 18: "Animal Nutrition" for nutritional diseases
6. Studies on tissue and organ storage and preservation, if emphasis is on composition or metabolism rather than on methods for preparation, maintenance, or analysis: Appropriate organism-related section.
7. All studies, including methodological, on the preservation of body fluids (e.g., blood and semen) and/or the cells contained therein (e.g., erythrocytes and spermatozoa): Appropriate organism-related section.
8. Physiological studies with organs, tissues, cells, or subcellular components from plants or animals: Specific organism-related or other appropriate section.
9. Methods for the development or manufacture of artificial organs, e.g., heart, lung, kidney, or blood-dialysis machines, and other prosthetic devices: Section 63: "Pharmaceuticals"
10. Techniques, reagents, and methods in animal nutritional balance evaluation: Section 18: "Animal Nutrition"
11. Xenobiochemistry: Section 6: "General Biochemistry"
12. Taxonomic classification of organisms or species when the methodology is not of interest: Appropriate organism-specific section if appropriate to a single CA section, or Section 6: "General Biochemistry" if of interest to two or more sections of CA.
13. Labeling of compounds by nuclear reactions: Section 71: "Nuclear Technology"
14. Biogeoprospecting (e.g., location of a metal ore deposit by the determination of a higher-than-normal amount of the metal in indigenous plants): Section 53: "Mineralogical and Geological Chemistry"
15. Nontaxonomic comparisons of organisms involving two or more sections of CA, when the emphasis is not on methodology: Section 6: "General Biochemistry"
16. Commercial methods or apparatus for separating blood fractions for transfusion: Section 63: "Pharmaceuticals"
17. Genetic methods including methods such as nucleic acid sequencing, molecular cloning, nucleic acid amplification (e.g., PCR), mutagenesis, gene mapping, hybridization, and introduction of foreign nucleic acid: Section 3: "Biochemical Genetics"
18. Methods applied to genetic material where the interest is in biochemical genetics: Section 3: "Biochemical Genetics"
19. Methods for determining, detecting, or identifying blood-coagulation factors that are enzymes, e.g., blood-coagulation factor Xa, or their proenzymes (zymogens), e.g., blood-coagulation factor X: Section 7: "Enzymes"
20. Pharmacology of diagnostic agents: Section 1: "Pharmacology"
21. Methods for imaging procedures which use radiation monitoring: Section 8: "Radiation Biochemistry"

22. Nonindustrial syntheses of organic compounds involving an enzymic step where the emphasis is on the production of the product: Appropriate organic chemistry section. See (C.3); Syntheses of organic compounds involving an enzymic step on an industrial level: Section 16: "Fermentation and Bioindustrial Chemistry"
23. Methodology for the analysis of materials covered by the macromolecular chemistry sections (Sections 35-46): appropriate Macromolecular Chemistry Section:
- Section 35: "Chemistry of Synthetic High Polymers"
 - Section 36: "Physical Properties of Synthetic High Polymers"
 - Section 37: "Plastics Manufacture and Processing"
 - Section 38: "Plastics Fabrication and Uses"
 - Section 39: "Synthetic Elastomers and Natural Rubber"
 - Section 40: "Textiles and Fibers"
 - Section 41: "Dyes, Organic Pigments, Fluorescent Brighteners, and Photographic Sensitizers"
 - Section 42: "Coatings, Inks, and Related Products"
 - Section 43: "Cellulose, Lignin, Paper, and Other Wood Products"
 - Section 44: "Industrial Carbohydrates"
 - Section 45: "Industrial Organic Chemicals, Leather, Fats, and Waxes"
 - Section 46: "Surface-Active Agents and Detergents"
24. Methodology for the analysis of synthetic proteins, peptides, and oligonucleotides when no biological interest or source is stated: Section 80: "Organic Analytical Chemistry"
25. Biochemical methods applicable to two biochemical sections that normally include analytical methods: Biochemistry section of major emphasis. (See C.5); Analytical methods applicable to a biochemical section(s) and nonbiochemical section(s) that normally include analytical methods as well as general analytical methods:
- Section 79: "Inorganic Analytical Chemistry"
 - Section 80: "Organic Analytical Chemistry" (See C.3)
- NOTE: For placement in another section that includes analysis, the materials covered by that section must be actual samples being analyzed, or the method must be specified to be for the analysis of those materials when the actual samples analyzed are model systems.
26. Excluded from coverage in CA:
- a. Methods for labeling a whole cell, tissue, or organ with an isotope in order to study the circulation or half-life (with no new chemistry).
 - b. Histochemical and cytochemical embedding and fixation (with no new chemistry).
 - c. Purification, isolation or immortalization of whole cells, viruses, etc. (with no new chemistry)
 - d. Nonchemical preparation or purification of subcellular fractions (mitochondria, ribosomes, nuclei, etc.) without actual or implied chemical characterization or biochemical application.
 - e. Identification of microorganisms only by growth or lack of growth on an incompletely defined medium.

C. Cross-References

1. A.3 - Cross-refer to appropriate organism-related section.
2. B.3 -
 - Section 11: "Plant Biochemistry"
 - Section 12: "Nonmammalian Biochemistry"
 - Section 14: "Mammalian Pathological Biochemistry"
 - Section 15: "Immunochemistry"
 - Section 18: "Animal Nutrition"
3. B.21, B.22 - Section 9: "Biochemical Methods"

4. A.1 - Cross-refer to appropriate section for the method used for analysis of inorganic or organic compounds when biological interest is not stated.
5. B.25 - Cross-refer to biochemistry section of minor interest.

D. Subsection Arrangement

0. Reviews
1. Apparatus (All new apparatus or significant modifications of apparatus, no matter what method is used)
2. Biological
 - Bioassay
 - Enzymes used in analysis
3. Chromatographic
 - Affinity
 - Chromatofocusing
 - Column
 - Gas
 - Gel filtration
 - Field-flow-fractionation
 - Ion-exchange
 - Liquid
 - Paper
 - Supercritical fluid
 - Thin-layer
4. Cytochemical and histochemical
 - Microscopy
 - Stains
 - Staining
 - Tissue preparation
5. Spectral and related methods
 - CD
 - Color and spot tests
 - Colorimetry
 - Crystallography
 - Cytometry
 - Electron microprobe
 - Fluorometry
 - Mass fragmentography
 - Nephelometry
 - Photometry
 - Polarimetry
 - Refractometry
 - Spin labeling
 - Turbidimetry
 - X-ray diffraction
 - Absorption spectrometry
 - Atomic absorption spectrometry
 - Atomic emission spectrometry
 - ESR spectrometry
 - IR spectrometry
 - Luminescence spectrometry
 - Mass spectrometry
 - Microwave spectrometry
 - Moessbauer spectrometry
 - NMR spectrometry
 - Phosphorescence spectrometry
 - Raman spectrometry
 - Reflection spectrometry
 - UV spectrometry
 - X-ray fluorescence spectrometry
6. Density- and weight-dependent methods
 - Centrifugation
 - Sedimentation
 - Gravimetry
 - Thermogravimetry
7. Electrical
 - Amperometry
 - Conductometry
 - Coulometry
 - Voltammetry
 - Polarography
 - Electrodes
 - Enzyme
 - Ion-selective
 - pH
 - Electrophoresis
 - Iontophoresis
 - Isoelectric focusing
 - Isotachophoresis
 - Potentiometry

8. Isotopic and radioisotopic analysis
 - Isotope dilution
 - Neutron activation
 - Radioassay
 - Radioreceptor assay
 - Stable and radioactive isotopes
 - Activation analysis
 - Autoradiography
 - Competitive protein-binding
9. Miscellaneous separations (not covered at other subsections)
 - Extraction
 - Filtration
 - Precipitation
 - Solubilization
 - Coil planet centrifugation
 - Countercurrent distribution
 - Dialysis
 - Distillation
10. Immunological
(All immunoassays and combinations of immunological methods with other techniques, e.g., radioimmunoassay, immunoelectrophoresis, immunoelectron microscopy.)
11. Culture and Preservation
 - Cell or organ or tissue culture of animals and plants
 - Animal organ preservation for transplantation
 - Preparation and maintenance of subcellular components of animals and plants
 - Organ perfusion
12. Drug susceptibility tests
 - Methodology of in vitro tests of the effects of antimicrobials on microorganisms
13. Life-support systems
(Apparatus and chemical technology associated with such systems, e.g., atmospheric regeneration in space vehicles.)
14. Synthesis
 - Labeling methods
15. Reagents
 - when not appropriate at any other subsection
16. Other (not covered at other subsections)
 - Calorimetry
 - Computers in analysis
 - Hydrolysis
 - Immobilization
 - Oxidation
 - Thermal analysis
 - Volumetric
 - Titrimetric
 - Combination methods
 - Photoaffinity labeling

Section 10: Microbial, Algal, and Fungal Biochemistry

A. Coverage in This Section

1. Biochemical, metabolic, defense mechanisms, and nutritional studies of microorganisms (bacteria, viruses, rickettsiae, algae, fungi and lichens (regardless of their size), yeasts, and protozoa). (See B.1-3, B.9, B.13, B.18, B.20, B.21, C.1)
2. Bial composition, subcellular composition, and development. (See B.6, B.9, B.14-18)
3. Mechanism of metabolic formation of microbial products (e.g., toxins or pigments) and their relation to the physiology of the producing microorganism. (See B.4-7, B.13)
4. Studies by classical genetic techniques of the inheritance of chemical and physiological properties by microorganisms which are not of immediately exploitable commercial importance. (See B.2, B.7, B.13)
5. Chemical taxonomic classification of microorganisms based on established methods. (See B.24b)
6. Studies reporting the details of the isolation and identification of natural products (including antibiotics) occurring in or produced by microorganisms, even when the studies include detailed structural elucidation and/or physicochemical analysis. (See B.4, B.6, B.14-B.17, B.23)
7. Effects of medicinal-type antibiotics, bactericides, fungicides, etc., on microorganisms in vitro. (See B.10)
8. General microbial sterilization (disinfection) studies associated with biochemical or medical technology. (See B.11, B.21, B.22, C.2)
9. Mechanisms of intercellular DNA or RNA transfer and metabolic regulation emphasizing metabolite flux rather than gene expression. (See B.13)
10. Physiological studies of mutant microorganisms. (See B.13, B.23)
11. Correlation of the structure and/or physicochemical properties of natural products from microorganisms with their biological properties, even when the thrust of the paper is structural elucidation. (See B.4, B.6, B.13-17)
12. Gene function in physiology, as well as transcription, translation, or gene expression, when the interest is in the mRNA or product. (See B.12, B.13, B.14-17)

B. Alternative Placement and Exclusion from Coverage in CA

1. Pathological in vivo effects of clinical infections of other (whole nonmicrobial) organisms with microorganisms. (See C.3)
Plants: Section 11: "Plant Biochemistry"
Nonmammals: Section 12: "Nonmammalian Biochemistry"
Mammals: Section 14: "Mammalian Pathological Biochemistry"
2. Improvement of microbial strains for use in industrial fermentations: Section 16: "Fermentation and Bioindustrial Chemistry"
3. Microbial-induced food toxicity: Section 17: "Food and Feed Chemistry"
4. Chemical synthesis of natural products from microorganisms: Appropriate organic chemistry section if synthesis does not involve a major fermentative or industrial enzymic step; Section 16: "Fermentation and Bioindustrial Chemistry" if synthesis involves a major fermentative or industrial enzymic step.
5. Vaccine production involving chemistry: Section 63: "Pharmaceuticals" (See C.3)
6. Microbial products that interact with the immune system: Section 15: "Immunochemistry"
7. Microbial biosynthesis of antibiotics, alcohols, and other industrial fermentative products: Section 16: "Fermentation and Bioindustrial Chemistry"
8. Photosynthetic processes involving chlorophylls in microbial systems: Section 11: "Plant Biochemistry"
9. Biochemical studies of subcellular processes when the preparation is in the subcellular state during the process, and when there is no comparison of physiological states or emphasis on the process at the cellular level: Section 6: "General Biochemistry"

10. Effects of virucides against viruses in animal tissues in vitro or in vivo, and in vivo studies with antimicrobial agents: Section 1: "Pharmacology"
Methodology of antimicrobial sensitivity tests: Section 9: "Biochemical Methods"
11. Formulation of disinfectants: Section 63: "Pharmaceuticals"
12. Effects of chemical mutagens on microorganisms, if emphasis is on the effect of the mutagen: Section 4: "Toxicology"
13. Mechanism of transcription or gene expression as well as the mechanism of genome replication, recombination, rearrangement, amplification, mutation, reverse transcription, and repair when the interest is in the mechanism: Section 3: "Biochemical Genetics"
14. Structural elucidation and/or physicochemical properties of natural products (other than proteins and nucleic acids) from microorganisms, in which isolation procedures are not detailed (i.e., product has been isolated previously from that source) and in which no correlation with biological properties is made: Appropriate organic chemistry section. (See C.3)
15. Physicochemical properties and structure of microbial proteins and noninformational nucleic acids (other than simple composition studies):
Section 7: "Enzymes" for enzymes
Section 15: "Immunochemistry" for immunological substances
Section 6: "General Biochemistry" for others
16. Physicochemical properties of microbial informational nucleic acids (other than simple composition studies):
Section 6: "General Biochemistry"
17. Sequences of informational nucleic acids: Section 3: "Biochemical Genetics" appropriate product section.
18. Effects of low- or high-energy electromagnetic and corpuscular radiation (including visible light) on microorganisms or their subcellular components: Section 8: "Radiation Biochemistry"
19. Effects of purified microbial toxins on plants, nonmammals, and plants: Section 4: "Toxicology"
20. Toxic effects of agrochemicals on nontarget organisms: Section 4: "Toxicology"
21. In vivo effects of antibiotics and other antimicrobials on animal pathogens: Section 1: "Pharmacology"
22. Agricultural application of agents such as bactericides, fungicides, and virucides as well as industrial applications of fungicides, algicides, and slimicides: Section 5: "Agrochemical Bioregulators"
23. Novel genetic methods including methods such as nucleic acid sequencing, molecular cloning, nucleic acid amplification (e.g., PCR), mutagenesis, gene mapping, hybridization, and introduction of foreign nucleic acid as well as genetic engineering methodology and the application of established methods in the development of genetically engineered organisms: Section 3: "Biochemical Genetics"
24. Excluded from coverage in CA:
 - a. Nonchemical culture techniques.
 - b. Taxonomic identifications involving only morphological identification and/or standard batteries of metabolic tests (e.g., sugar fermentation) in which no novel substrate or product is a major consideration of the study.

C. Cross-References

1. A.1 - Section 19: "Fertilizers, Soils, and Plant Nutrition" for soil microorganism studies.
2. A.8 - Disinfectants used for specific products: Cross-refer to section concerning product.
3. B.1, B.5, B.14 - Section 10: "Microbial, Algal, and Fungal Biochemistry"

D. Subsection Arrangement

0. Reviews
1. Composition and products

2. Metabolism and microbial nutrition
3. Growth, development, and aging
4. Classical genetics
5. Antimicrobial sensitivity
6. Other

Section 11: Plant Biochemistry

A. Coverage in This Section

1. Chemical and immunochemical studies in plants. (See B.1, B.5, B.9, B.10, B.12-16, B.21, B.24, B.25)
2. Studies reporting the details of the isolation and identification of natural products occurring in or produced by plants, even when the studies include detailed structural elucidation and/or physicochemical analysis. (See B.3, B.6, B.13, B.15, B.17-B.20, B.22)
3. Studies detailing the correlation of the structure and/or physicochemical properties of natural products from plants with their biological properties. (See B.3, B.6, B.15, B.17-B.20)
4. Biochemistry of plant diseases and parasites and their control relative to the intact plant or plant cell. (See B.2, B.23)
5. Photosynthetic studies of plants, even at the subcellular level, including such studies in algae and bacteria if the interest is in the process and involves visible radiation and chlorophyll, chloroplasts, or the Hill reaction, etc., and such studies in aquatic systems (algal blooms, primary production, phytoplankton population interactions) wherein emphasis is on the organism rather than on the water.
6. Tobacco and tobacco products (cigarettes, cigars), including storage, curing, manufacture, and analysis. (See B.4, B.22)
7. Naturally occurring plant hormones, their physiological effects, metabolism, and mode of action, when the emphasis is primarily physiological rather than agrochemical (includes studies using experimental addition of naturally occurring plant hormones to mimic or elucidate the effect of the natural hormone). (See B.7, B.23)
8. Storage, culture, and preservation of plant cells and tissues if emphasis is on composition or metabolism rather than on methods for preparation, maintenance, or analysis. (See B.12, B.16, B.22)
9. Classical genetics (inheritance of physiological properties) and phylogeny in plants.
10. Photoperiodicity and phototropism. (See B.14)
11. Gene function in physiology, as well as transcription, translation, or gene expression, when the interest is in the mRNA or product. (See B.5, B.11, B.13, B.23)
12. Plant responses to soil stress. (See B.24)

B. Alternative Placement and Exclusion from Coverage in CA

1. Biochemical studies of subcellular processes when the preparation is in the subcellular state during the process, and when there is no comparison of physiological states or emphasis on the process at the cellular level: Section 6: "General Biochemistry"
2. Agents used in the control of plant diseases from the viewpoint of the organism causing the disease: Section 5: "Agrochemical Bioregulators"
3. Commercial growth and use of medicinal plants: Section 63: "Pharmaceuticals"
4. Toxicity and carcinogenicity of tobacco products and tobacco smoke: Section 4: "Toxicology"
5. Plant nutrition including studies of the genetic engineering of plants to improve plant nutrition where the interest is in the physiology or commercial application and not in the methodology of the genetic engineering: Section 19: "Fertilizers, Soils, and Plant Nutrition"
6. Chemical syntheses of natural products from plants: Appropriate organic chemistry section if synthesis does not involve a major fermentative or industrial enzymic step; Section 16: "Fermentation and Bioindustrial Chemistry" if synthesis involves a major fermentative or industrial enzymic step.
7. Effects of herbicides, plant hormones, and other exogenously supplied growth regulators when the interest is primarily in improving crop production or in agrochemical synergism: Section 5: "Agrochemical Bioregulators"
8. Toxic effects of herbicides and pesticides on nontarget plants:
 - a. If the interest is primarily toxicological: Section 4: "Toxicology"

- b. If the interest is primarily agricultural (e.g., effect on crop growth, yield, or metabolism): Section 5: “Agrochemical Bioregulators”
9. Studies involving aquatic plants in which the interest is primarily in the water source or habitat rather than in the plant: Section 61: “Water”
 10. Plant composition measured as a monitoring tool in the determination of air, water, and/or industrial pollution: Section 4: “Toxicology”
 11. Effects of chemical mutagens on plants if emphasis is on the mutagen: Section 4: “Toxicology”
 12. Development and initial characterization of cell lines when the emphasis is on the method: Section 9: “Biochemical Methods”
 13. Mechanism of transcription or gene expression as well as the mechanism of genome replication, recombination, rearrangement, amplification, mutation, reverse transcription, and repair when the interest is in the mechanism: Section 3: “Biochemical Genetics”
 14. Effects of low- or high-energy electromagnetic (including nonphotoperiodicity and nonphotosynthetic studies on light) and corpuscular radiation on plants or their isolated tissues and subcellular components: Section 8: “Radiation Biochemistry”
 15. Post-harvest studies on preparation, preservation, storage, or use of plants or plant parts as food: Section 17: “Food and Feed Chemistry”
 16. Application of plant cell culture in fermentations: Section 16: “Fermentation and Bioindustrial Chemistry”
 17. Structural elucidation and/or physicochemical properties of natural products (other than proteins and nucleic acids) from plants in which isolation procedures are not detailed (i.e., product has been isolated previously from that source) and in which no correlation with biological properties is made: Appropriate organic chemistry natural products section. (See C.1)
 18. Physicochemical properties and structure of plant proteins and noninformational nucleic acids (other than simple composition studies):
Section 7: “Enzymes” for enzymes;
Section 6: “General Biochemistry” for others.
 19. Physicochemical properties of plant informational nucleic acids (other than simple composition studies):
Section 6: “General Biochemistry”
 20. Sequences of informational nucleic acids: Section 3: “Biochemical Genetics” appropriate product section.
 21. Biogeoprospecting (e.g., location of ore deposits by the determination of higher-than-normal amounts of metals in indigenous plants): Section 53: “Mineralogical and Geological Chemistry”
 22. Novel genetic methods including methods such as nucleic acid sequencing, molecular cloning, nucleic acid amplification (e.g., PCR), mutagenesis, gene mapping, hybridization, and introduction of foreign nucleic acid as well as genetic engineering methodology and the application of established methods in the development of genetically engineered organisms: Section 3: “Biochemical Genetics”
 23. Agronomically or commercially oriented studies of pest and herbicide resistance in genetically engineered plants: Section 5: “Agrochemical Bioregulators”
 24. Plant-soil interactions, including effects of amendments and irrigation: Section 19: “Fertilizers, Soils, and Plant Nutrition”
 25. Algae, fungi, and lichen (regardless of size) studies: Section 10: “Microbial, Algal, and Fungal Biochemistry”

C. Cross-References

1. B.17 - Section 11: “Plant Biochemistry”

D. Subsection Arrangement

0. Reviews
1. Composition and products

2. Metabolism
3. Development and aging
4. Classical genetics and phylogeny
5. Pathology
6. Photosynthesis (algae, bacteria, and green plants)
7. Tobacco and tobacco products
8. Other

Section 12: Nonmammalian Biochemistry

A. Coverage in This Section

1. Biochemistry, physiology, and pathology of members of the animal kingdom, except protozoa and mammals, including the effects of exogenous biochemical substances that cannot be more specifically placed. (See B.1-3, B.4, B.5, B.11, B.14-16, B.22-24)
2. Studies reporting the details of the isolation and identification of natural products occurring in or produced by nonmammals, even when the studies include detailed structural elucidation and/or physicochemical analysis. (See B.7, B.9, B.12, B.18-21)
3. Composition, as in A.2, at subcellular levels, when characterization, amounts, and locations are the primary interest. (See B.2, B.7-9)
4. Metabolism, from the cellular level to the intact nonmammal, including physiology and pathology. (See B.1, B.2, B.8, B.14, B.24)
5. Chemistry of development (embryology, metamorphosis, regeneration), classical genetics (inheritance of physiological properties), and phylogeny of nonmammals. (See B.1, B.14, B.15, B.24)
6. Storage, culture, and preservation of nonmammalian cells, tissues, and organs if emphasis is on composition or metabolism rather than on methods for preparation, maintenance, or analysis. (See B.10-11, B.23)
7. Physiological stress of nonmammals. (See B.2, B.3-5, B.15, B.16, B.22)
8. Physiological (general levels, metabolism, etc.) and pharmacological studies of hormones in nonmammalian systems. (See B.4, B.5, B.13, B.22, B.24)
9. Physiology of the elaboration of toxins and venoms by nonmammals. (See B.6)
10. Correlation of the structure and/or physicochemical properties of natural products from nonmammals with their biological properties. (See B.7, B.9, B.12, B.14, B.18-21, B.24)
11. Chemical effects of radiation in normal radiation-related physiological events, e.g., visible or UV radiation in vision or photoperiodicity. (See B.16)
12. Gene function in physiology, as well as transcription, translation, or gene expression when the interest is in the mRNA or product. (See B.14 and B.18-21, B.24)
13. Physiology of smell and taste, including structure-perception studies, as well as the physiology of other sensory mechanisms.

B. Alternative Placement and Exclusion from Coverage in CA

1. Immunochemistry studies in nonmammalian systems: Section 15: "Immunochemistry"
2. Uncontrolled exposure of nonmammals to the effects of environmental pollution and the use of nonmammals as indicators of pollution:
Section 19: "Fertilizers, Soils, and Plant Nutrition"
Section 59: "Air Pollution and Industrial Hygiene"
Section 61: "Water"
Controlled studies on the effects of exposure to environmental pollution in nonmammals: Section 4: "Toxicology"
3. Nonmammalian nutrition, including disease states resulting from inanition, deficiency disease, and nutritional obesity: Section 18: "Animal Nutrition"

4. Effects of agricultural pesticides, baits, sterilants, and juvenile hormones (only when the interest is in pesticide control) on target organisms: Section 5: "Agrochemical Bioregulators"
Effects of veterinary pesticides administered internally to nonmammals: Section 1: "Pharmacology"
5. Toxic effects of agricultural pesticides, baits, sterilants, attractants, and juvenile hormones on nontarget organisms: Section 4: "Toxicology"
6. Toxicological studies of venoms and toxins of nonmammalian origin: Section 4: "Toxicology"
7. General biochemical studies of nonmammalian enzymes, such as isolation and purification, characterization, substrate specificity, kinetics: Section 7: "Enzymes"
8. Biochemical studies of subcellular processes when the preparation is in the subcellular state during the process, and when there is no comparison of physiological states or emphasis on the process at the cellular level: Section 6: "General Biochemistry"
9. Oils from nonmammalian sources with probable application as foods: Section 17: "Food and Feed Chemistry"
10. Applications of nonmammalian cell cultures in fermentation: Section 16: "Fermentation and Bioindustrial Chemistry"
11. Development and initial characterization of cell lines when the emphasis is on the method: Section 9: "Biochemical Methods"
12. Analysis of nonmammalian hormones, unless of agrochemical or commercial interest: Section 9: "Biochemical Methods"
13. Effects of nonmammalian hormones on mammals or mammalian systems: Section 2: "Mammalian Hormones"
14. Mechanism of transcription or gene expression as well as the mechanism of genome replication, recombination, rearrangement, amplification, mutation, reverse transcription, and repair when the interest is in the mechanism: Section 3: "Biochemical Genetics"
15. Effects of chemical mutagens (except drugs and food constituents) on nonmammals: Section 4: "Toxicology"
16. Effects of low- and high-energy electromagnetic (including visible light) and corpuscular radiation on nonmammals or their isolated tissues and subcellular components: Section 8: "Radiation Biochemistry"
17. Chemical synthesis of natural products from nonmammals: Appropriate organic chemistry section if synthesis does not involve a major fermentative or industrial enzymic step; Section 16: "Fermentation and Bioindustrial Chemistry" if synthesis involves a major fermentative or industrial enzymic step.
18. Structural elucidation and/or physicochemical properties of natural products (other than proteins and nucleic acids) from nonmammals, in which isolation procedures are not detailed (i.e., product has been isolated previously from that source) and in which no correlation with biological properties is made: Appropriate organic chemistry section. (See C.1)
19. Physicochemical properties and structure of nonmammalian proteins and noninformational nucleic acids (other than simple composition studies):
Section 7: "Enzymes" for enzymes
Section 15: "Immunochemistry" for immunological substances
Section 6: "General Biochemistry" for others
20. Physicochemical properties of nonmammalian informational nucleic acids (other than simple composition studies): Section 6: "General Biochemistry"
21. Sequences of informational nucleic acids: Section 3: "Biochemical Genetics" appropriate product section.
22. Hormone feed additives or implants for the purpose of enhancing nonmammalian growth or production of meat, eggs, and other products: Section 18: "Animal Nutrition"
23. Novel genetic methods including methods such as nucleic acid sequencing, molecular cloning, nucleic acid amplification (e.g., PCR), mutagenesis, gene mapping, hybridization, and introduction of foreign nucleic acid as

well as genetic engineering methodology and the application of established methods in the development of genetically engineered organisms: Section 3: “Biochemical Genetics”

24. Studies of interest to mammalian hormones in model nonmammalian systems: Section 2: “Mammalian Hormones”

C. Cross-References

1. B.18 - Section 12: “Nonmammalian Biochemistry”

D. Subsection Arrangement

0. Reviews

1. Composition and products

- Distribution
- Identification
- Localization

2. Metabolism

- Degradation
- Formation
- Processing
- Transport

3. Development and aging

- Developmental Stages
- Embryo
- Fertilized eggs
- Fetus
- Newborn
- Senescence

4. Classical genetics and phylogeny

- | | |
|--|---|
| <ul style="list-style-type: none"> • Evolution • Gene frequency • Genetic polymorphism • Inheritance | <ul style="list-style-type: none"> • Phenotypic variation • Population Genetics • Taxonomy |
|--|---|

5. Pathology

- | | |
|---|---|
| <ul style="list-style-type: none"> • Abnormal development • Carcinogenesis • Hereditary diseases • Infections | <ul style="list-style-type: none"> • Metabolic disorders • Neoplasms • Osmoregulatory and renal disorders • Physiological disorders |
|---|---|

6. Other

- | | | |
|---|---|---|
| <ul style="list-style-type: none"> • Adaptation • Behavior • Cell cycle • Cell differentiation • Cell proliferation • Contraction • Electric phenomena | <ul style="list-style-type: none"> • Fertilization • Hibernation • Meiosis • Mitosis • Neurotransmission • Olfaction • Oogenesis | <ul style="list-style-type: none"> • Ovarian cycle • Pregnancy • Rhythms • Spermatogenesis • Stress • Temperature effects • Vision |
|---|---|---|

Subsection hierarchy (most preferred to least preferred):

0 > 5 > 4 > 3 > 6 > 2 > 1

The subsection hierarchy should be based on the major point of the paper.

Section 13: Mammalian Biochemistry

A. Coverage in This Section

1. Chemical reactions of normal mammalian life processes, including those involved with substances normally ingested by mammals, as well as metabolism of endogenous substances and the effects of exogenous biochemical substances that cannot be more specifically placed. (See B.5, B.18)
2. Studies reporting the details of the isolation and identification of natural products occurring in or produced by mammals, even when the studies include detailed structural elucidation and(or) physicochemical analysis. (See B.2, B.3, B.6, B.8, B.16, B.18, B.20, B.24-27, and B.29)
3. Composition, as in A.2, at subcellular levels, where amounts and locations are the major interest.
4. Chemistry of the blood and formed elements of blood, physiological levels of blood constituents, blood clotting and clotting factors and mechanisms, blood-clotting enzyme activation, preservation (including methodological studies) of blood and other body fluids (e.g., semen) and/or the cells contained therein (e.g., erythrocytes and spermatozoa), and reactions in stored blood. (See B.6, B.9-13, B.15, B.20)
5. Physiological interactions of blood coagulation factors with each other and with other chemical substances normally found in the circulatory system both in vitro and in vivo. (See B.9-12)
6. Rumen studies, including in vitro studies. (See B.1)
7. Storage, culture, and preservation of mammalian cells, tissues, and organs (including tumor cells if the study is not cancer-oriented, and preservation of organs for ultimate use as transplants but not directly involving immunochemistry), if emphasis is on composition or metabolism rather than on methods of preparation, maintenance, or analysis. (See B.8, B.15, B.28)
8. Regeneration of mammalian cells, tissues, or organs when the interest is in the normal biochemistry of these entities rather than in their recovery from trauma or a pathological state. (See B.3, B.18)
9. Biochemistry of the normal aging process. (See B.3)
10. Studies which employ surgical procedures or chemical treatment to render an organ nonfunctional so that functions of the normal organ can be compared. (See B.3, B.6, B.30)
11. Normal pregnancy, fetal and postnatal development, (including nonpathological prematurity), and classical genetics. (See B.3, B.6, B.16, B.18-19, B.22)
12. Physiological stress (exhaustion, inanition, pressure, high altitude, heat, noise, etc.) and adaptation thereto. (See B.3-4, B.7)
13. Chemical effects of radiation in normal radiation-related physiological events, e.g., light in vision, visible or UV radiation in photoperiodicity. (See B.7, B.18)
14. Growth and contact-inhibition studies of intact, normal, mammalian cells (e.g., use of plant lectins as investigative tools to determine cell-membrane components responsible for growth regulation) as well as tumor cells, when the study is not cancer oriented. (See B.17)
15. Biochemical studies on nonpathological behavior including homosexuality, transvestism, etc. (See B.3, B.6)
16. Studies detailing the correlation of the structure and(or) physicochemical properties of natural products from mammals with their biological properties. (See B.2, B.3, B.6, B.8, B.16, B.18, B.20, B.24-27)
17. Physiology of smell and taste, including structure-perception studies, as well as the physiology of other sensory mechanisms.
18. Gene function in physiology, as well as transcription, translation, or gene expression, when the interest is in the mRNA or product. (See B.2-3, B.5-6, B.16, B.18-20, and B.24-27)

B. Alternative Placement and Exclusion from Coverage in CA

1. Rumen studies in which the primary interest is microbiological: Section 10: "Microbial, Algal, and Fungal Biochemistry"

2. General biochemical studies of mammalian enzymes, such as isolation and purification, characterization, substrate specificity, or kinetics: Section 7: "Enzymes"
3. Pathological states, including those associated with aging, those associated with transformation by viruses, those states commonly recognized as a result of spontaneous disease or disorder, those associated with trauma or pathological stress, and surgical procedures or chemical treatment to simulate a disease state: Section 14 "Mammalian Pathological Biochemistry"
Diseases distinctly recognized as resulting from nutritional disorders: Section 18: "Animal Nutrition"
4. Starvation to produce nutritional deficiencies or disorders and nutritional studies of obesity: Section 18: "Animal Nutrition"
5. Biochemical studies of subcellular processes when the preparation is in the subcellular state during the process, and when there is no comparison of physiological states or emphasis on the process at the cellular level: Section 6: "General Biochemistry"
6. Mammalian hormone chemistry, metabolism, physiology, and pharmacology, including blood level and organ composition studies and removal of endocrine glands or depletion of a hormone to study its effect; also the use of neurotransmitter-neuromodulator agonists and antagonists as tools in the elucidation of the neurohormonal aspects of mammalian neurophysiology: Section 2: "Mammalian Hormones"
7. Effects of low- or high-energy electromagnetic (including visible light) and corpuscular radiation on mammals or their isolated tissues and subcellular components if not concerned with physiological processes (e.g., vision and photoperiodicity): Section 8: "Radiation Biochemistry"
8. Tissue culture studies directly involving immunochemistry (transplantation or graft reactions): Section 15: "Immunochemistry"
9. Analytical methods for determining blood-clotting factors.
 - a. Enzymic factors and precursors (e.g., factor IX): Section 7: "Enzymes"
 - b. Nonenzymic factors (e.g., fibrin): Section 9: "Biochemical Methods"
10. Preparation (methods and apparatus) of purified blood fractions (usually for transfusion): Section 63: "Pharmaceuticals"
11. Pharmacological aspects of blood substitutes and plasma expanders: Section 1: "Pharmacology"
12. Pharmaceutical aspects (preparation, packaging, etc.) of blood substitutes and plasma expanders: Section 63: "Pharmaceuticals"
13. All aspects (including biological effects, therapeutic use, and toxicity/biocompatibility) of life-maintaining devices and prosthetics: Section 63: "Pharmaceuticals"
14. Deleterious and therapeutic effects of oxygen in greater-than-normal concentrations and/or pressures:
Section 4: "Toxicology"
Section 14: "Mammalian Pathological Biochemistry", respectively.
15. Development and initial characterization of cell lines when the emphasis is on the method: Section 9: "Biochemical Methods"
16. Immunogenetics (polymorphism of immunoglobulins, blood-group antigens, etc.) in which the interest is primarily in the structure of an immunological substance or its role in immunological reactions: Section 15: "Immunochemistry"
17. Growth-regulatory and contact-inhibition studies of pathological mammalian cells, when the interest is in the pathological condition: Section 14: "Mammalian Pathological Biochemistry"
18. Mechanism of transcription or gene expression as well as the mechanism of genome replication, recombination, rearrangement, amplification, mutation, reverse transcription, and repair when the interest is in the mechanism: Section 3: "Biochemical Genetics"
19. Effects of chemical mutagens (except drugs and food constituents) on mammals if emphasis is on the mutagen: Section 4: "Toxicology"
20. Physicochemical and structure studies on blood and blood-clotting biopolymers, without substantial emphasis on blood clotting for nonenzymic factors: Section 6: "General Biochemistry"

For enzymic factors: Section 7: “Enzymes”

21. Acupuncture studies, if chemical, on mammals: Section 14: “Mammalian Pathological Biochemistry”
22. Hormone effects in development: Section 2: “Mammalian Hormones”
23. Chemical syntheses of natural products from mammals: Appropriate organic chemistry section if synthesis does not involve a major fermentative or industrial enzymic step; Section 16: “Fermentation and Bioindustrial Chemistry” if synthesis involves a major fermentative or industrial enzymic step.
24. Structural elucidation and/or physicochemical properties of natural products (other than proteins and nucleic acids) from mammals, in which isolation procedures are not detailed (i.e., product has been isolated previously from that source) and in which no correlation with biological properties is made: Appropriate organic chemistry section. (See C.1)
25. Physicochemical properties and structure of mammalian proteins and noninformational nucleic acids (other than simple composition studies):
 - Section 2: “Mammalian Hormones” for hormones and hormonelike substances as well as their receptors
 - Section 7: “Enzymes” for enzymes
 - Section 15: “Immunochemistry” for immunological substances
 - Section 6: “General Biochemistry” for others
26. Physicochemical properties of mammalian informational nucleic acids (other than simple composition studies):
 - Section 6: “General Biochemistry”
27. Sequences of informational nucleic acids: Section 3: “Biochemical Genetics” appropriate product section.
28. Biochemistry of transplanted tissues and organs: Section 14: “Mammalian Pathological Biochemistry”
29. Genetic methods including methods such as nucleic acid sequencing, molecular cloning, nucleic acid amplification (e.g., PCR), mutagenesis, gene mapping, hybridization, and introduction of foreign nucleic acid as well as genetic engineering methodology and the application of established methods in the development of genetically engineered organisms: Section 3: “Biochemical Genetics”
30. Biochemical response to surgical contraceptive techniques: Section 2: “Mammalian Hormones”

C. Cross-References

1. B.24 - Section 13: “Mammalian Biochemistry”

D. Subsection Arrangement

0. Reviews
1. Composition and products
 - Distribution
 - Identification
 - Localization
2. Metabolism
 - Degradation
 - Formation
 - Processing
 - Transport
3. Development and aging

<ul style="list-style-type: none"> • Developmental stage • Embryo • Fertilized egg 	<ul style="list-style-type: none"> • Senescence • Newborn • Puberty
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- Fetus
- 4. Classical genetics and phylogeny
 - Evolution
 - Gene frequency
 - Genetic polymorphism
 - Inheritance
- 5. Blood
 - Blood cell composition
 - Blood metabolism
 - Blood cell metabolism
 - Blood coagulation
 - Blood composition
 - Fibrinolysis
- 6. General physiological chemistry

<ul style="list-style-type: none"> • Adaptation • Behavior • Cell cycle • Cell differentiation • Cell proliferation • Contraction • Electric phenomena • Exercise • Fertilization 	<ul style="list-style-type: none"> • Hibernation • Hypoxia • Lactation • Meiosis • Mitosis • Neurotransmission • Olfaction • Oogenesis 	<ul style="list-style-type: none"> • Phenotypic variation • Population genetics • Taxonomy <ul style="list-style-type: none"> • Blood coagulation factor metabolism • Blood cell differentiation • Blood cell preservation and storage • Blood preservation and storage • Blood coagulation factor interactions <ul style="list-style-type: none"> • Ovarian cycle • Pregnancy • Reproduction • Rhythms • Spermatogenesis • Stress • Temperature effects • Vision
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- 7. Other
 - Semen preservation
 - Tool studies

Subsection hierarchy (most preferred to least preferred):

0 > 4 > 3 > 6 > 5 > 2 > 1 > 7

The subsection should be based on the major point of the paper.

Section 14: Mammalian Pathological Biochemistry

A. Coverage in This Section

1. Biochemistry of diseases and disorders as they affect mammals. (See B.3, B.6, B.7, B.8, B.17)
2. Pathological conditions produced by surgical, chemical, or physical stressors to simulate or produce a disease state, when a chemical study of the resulting condition is included.
3. Clinical studies reporting levels of endogenous chemical substances in human and veterinary patients if the pathogenesis or the chemical nature of the disease process is discussed in relation to the observed chemical changes. (See B.19)
4. Growth-regulatory and contact-inhibition studies of pathological mammalian cells, when the interest is in the pathological condition. (See B.1)
5. In vivo biochemical studies of microbial infection, viral transfection, viral transformation, and in vitro studies if there is host-oriented emphasis. (See B.2)
6. Effects and mechanisms of action of toxins in association with microbial infections, including the effects of purified toxins, if there is infection-related interest. (See B.6, B.15)
7. Therapeutic use of hyperbaric oxygen. (See B.4)
8. Biochemistry of therapeutic procedures and techniques (e.g., hyperthermia, acupuncture, blood transfusion, cryotherapy, electric shock therapy). (See B.12, B.13)
9. Biochemistry of mammalian cell, tissue, and/or organ transplantation. (See B.6, B.16, B.18)
10. Diagnosis of disease in which there is no interest in the methodology or comparison of organ function tests, in the methodology or comparison of chemical determination or detection analytical techniques, or in the methodology or comparison of genetic methods. (See B.6-7, B.10)
11. Genetics of disease pathogenesis. (See B.2, B.3, B.6, B.7, B.8, B.17, C.2)
12. Hormone studies in disease pathogenesis and diagnosis of disease based on established methods for determining or detecting hormones. (See B.10, B.11, B.14, C.3)

B. Alternative Placement and Exclusion from Coverage in CA

1. Biochemistry of tumor cells which are used as model animal cells for studying composition and metabolism: Section 13: "Mammalian Biochemistry"
2. Biochemical changes in infectious diseases when the emphasis is on the infective agent: Appropriate organism-related section.
3. Alcoholism: Section 4: "Toxicology"
4. Oxygen toxicity: Section 4: "Toxicology"
5. Physiological stress (exhaustion, heat, high altitude, atmospheric hypoxia, etc.): Section 13: "Mammalian Biochemistry"
6. Immunochemical studies of diseases and tissue rejection: Section 15: "Immunochemistry"
7. Diseases distinctly recognized as resulting from nutritional disorders: Section 18: "Animal Nutrition"
8. Biochemistry of diseases resulting from air pollution and industrial pollutants in man: Section 59: "Air Pollution and Industrial Hygiene"
In experimental animals: Section 4: "Toxicology"
9. Diagnosis utilizing scintigraphic agents or radiocontrast media: Section 8: "Radiation Biochemistry"

10. Methodology or comparison of organ function tests and disease diagnosis based on new diagnostic agents and/or nonroutine or comparative methods for detecting or determining:
 - Mammalian hormones: Section 2: "Mammalian Hormones"
 - Enzymes: Section 7: "Enzymes"
 - Immunochemicals: Section 15: "Immunochemistry"
 - Other endogenous chemicals: Section 9: "Biochemical Methods"
 - Disease diagnosis based on nonroutine or comparative genetic methods: Section 3: "Biochemical Genetics"
11. Chemotherapy:
 - Section 1: "Pharmacology"
 - Section 2: "Mammalian Hormones"
12. All aspects (including biological effects, therapeutic use, and toxicity/biocompatibility) of life-maintaining devices and prosthetics: Section 63: "Pharmaceuticals"
13. Biochemical studies of the therapeutic use of electromagnetic radiation (e.g., radiation therapy, phototherapy): Section 8: "Radiation Biochemistry"
14. Biochemical response to surgical contraceptive techniques: Section 2: "Mammalian Hormones"
15. Effects of purified microbial toxins, when there is no expressed interest in infection: Section 4: "Toxicology"
16. Storage, culture, and preservation of mammalian cells, tissues, and organs for possible use as transplants but not directly involving transplantation or immunochemistry:
 - Section 13: "Mammalian Biochemistry" if emphasis is on composition or metabolism;
 - Section 9: "Biochemical Methods" if emphasis is on methods for development, preparation, maintenance, or analysis.
17. Mechanism of transcription or gene expression as well as the mechanism of genome replication, recombination, rearrangement, amplification, mutation, reverse transcription, and repair when the interest is in the mechanism and there is no disease interest: Section 3: "Biochemical Genetics"
18. Organ-regeneration studies: Section 13: "Mammalian Biochemistry"

C. Cross-References

1. B.10 - Section 14: "Mammalian Pathological Biochemistry"
2. A.11 - Section 3: "Biochemical Genetics"
3. A.12 - Section 2: "Mammalian Hormones"

D. Subsection Arrangement

0. Reviews
1. Oncology
 - Metastasis
 - Neoplasia
 - Tumor invasion
 - Neoplastic transformation
2. Surgery and trauma
3. Infectious diseases
 - Athlete's foot
 - Common cold
 - Dengue
 - Distemper
 - Gonorrhea
 - Herpes
 - Kala-azar
 - Malaria
 - Rheumatic fever
 - Tuberculosis
4. Respiratory diseases
 - Apnea
 - ARDS
 - Emphysema
 - Sarcoidosis
5. Cardiovascular diseases
 - Aneurysm
 - Hemorrhage
 - Stroke

- Atherosclerosis
- Hypertension
- Syncope
- 6. Hematology and reticuloendothelial system diseases
 - Anemia
 - Hemophilia
 - Marchifava-Micheli syndrome
 - DIC
 - Thalassemia
 - Polycythemia
- 7. Digestive tract diseases
 - Non-alc. cirrhosis
 - Gallstones
 - Dental caries
 - Hepatic coma
 - Gingivitis
 - Jaundice
- 8. Endocrine diseases
 - Addison's disease
 - Diabetes mellitus
 - Hyperglycemia
 - Diabetes insipidus
 - Hyperthyroidism
 - Simmond's disease
- 9. Skin diseases
 - Acne
 - Burn
 - Psoriasis
 - Eczema
 - Non-allergic dermatitis
 - Seborrhea
- 10. Nervous system and psychiatric diseases
 - Alzheimer's disease
 - Depression
 - Parkinson's disease
 - Cataract
 - Huntington's disease
 - Schizophrenia
 - Deafness
 - Mania
- 11. Musculoskeletal and connective tissue diseases
 - Arthritis
 - Fracture
 - Muscular dystrophy
 - Gout
 - General inflammation
 - Osteoporosis
- 12. Urological and male reproductive diseases
 - Male infertility
 - Renal failure
 - Urolithiasis
- 13. Obstetrics - gynecology
 - Amenorrhea
 - Neonatal hypoxia
 - Female infertility
 - Toxemia of pregnancy
- 14. Metabolic and hereditary diseases
 - Gangliosidosis
 - Tay-Sachs disease
 - Gaucher's disease
 - Zellweger's disease
- 15. Other
 - Behcet's syndrome
 - Werner's syndrome

These subsections are applied in hierarchical order with subsection 0 having highest priority.

Section 15: Immunochemistry

A. Coverage in This Section

1. Immunochemistry of immune mechanisms including chemical characterization, physicochemical properties, biological activity, chemical reactions, synthesis, and chemical methods for the purification or analysis of endogenous immunological mediators such as blood-group substances, immunoglobulins, complement, properdin, interferon, monokines, and lymphokines in animals, both vertebrate and invertebrate. (See B.1-21, C.4)
2. Chemical characterization, physicochemical properties, synthesis, or chemical reactions of exogenous immunological mediators when interest is in interaction with the immune system. (See B.10, B.18-21, C.4)
3. Metabolism, synthesis, biological responses, or occurrence of chemically defined antigens, antigenic determinants, or haptens. (See B.4, B.8, B.18-19, C.4)
4. Immunochemical responses to substantially purified immunological mediators. (See B.3-4, B.21)
5. Immune system interactions of microbial toxins. (See B.4)
6. Immune system interactions of lectins. (See B.12)
7. Immunochemical aspects of disease, including diagnosis of all diseases based on nonroutine or comparative methods for detecting or determining immunochemicals, and diagnosis of immunological diseases in which there is no interest in the methodology or comparison of organ function tests, in the methodology or comparison of nonimmunochemical determination or detection methods, or in the methodology or comparison of genetic methods. (See B.6-7, B.20)
8. Chemical mechanisms in antibody formation, allergy, and anaphylaxis including humorally mediated processes such as histamine release in anaphylaxis. (See B.3)
9. Immunochemistry of tissue grafts and organ transplants. (See B.3, B.6, B.9)
10. Immunochemical mechanisms of hemolysis, immunity, immune tolerance, nonpharmaceutical immunosuppression, and phagocytosis. (See B.4, B.8)
11. Nontherapeutic studies of hormones in immunological processes, including allergy and anaphylaxis, when the process is of primary interest. (See B.3, C.3)
12. Transcription and translation in the expression of immunological mediators, when the interest is in the immunological mediator. (See B.11)
13. Immune mediator interactions in transcription and translation. (See B.11)
14. Protein sequences of endogenous immunological mediators, including studies in which the DNA or RNA sequence is also given and in which the protein sequence is not incidental to the study. (See B.16)
15. Immunological mediator gene therapy either by artificial introduction of nucleic acid or manipulation of the genome to correct a given disorder. (See C.2)
16. Mechanism of immune mediator gene replication, recombination, rearrangement, amplification, mutation, reverse transcription, or repair. (See C.3)

B. Alternative Placement and Exclusion from Coverage in CA

1. Analytical methods for nonimmunochemicals which employ immunochemical procedures (e.g., immunoelectrophoresis): Section 9: "Biochemical Methods" section appropriate to the specific substance being determined.
2. Commercial preparations and formulation of immunological mediators as pharmaceutical agents and preparation of antibody-drug conjugates: Section 63: "Pharmaceuticals"
3. Therapeutic or potential therapeutic effects of hormones on immunological processes: Section 2: "Mammalian Hormones"

4. Immune system responses to drugs, nonbacterial toxic substances, and other exogenous chemicals: Section appropriate to the agent involved.
5. Forensic studies of blood-group substances: Section 4: "Toxicology"
6. Nonimmunochemical studies of diseases and transplantation:
Section 14: "Mammalian Pathological Biochemistry" for mammals
Section 12: "Nonmammalian Biochemistry" for nonmammals
7. Food allergies: Section 17: "Food and Feed Chemistry"
8. Biochemical studies with substances only incidentally identified as antigens by an immunochemical method: Section appropriate to the substance or study.
9. Storage, culture, and preservation of mammalian cells, tissues, and organs for possible use as transplants but not directly involving transplantation or immunochemistry:
Section 13: "Mammalian Biochemistry" if emphasis is on composition or metabolism
Section 9: "Biochemical Methods" if emphasis is on methods for preparation, maintenance, or analysis
10. Structural elucidation and/or physicochemical properties of immunological substances (other than proteins or noninformational nucleic acids, which remain in: Section 15: "Immunochemistry" in which isolation procedures are not detailed (i.e., product has been isolated previously from that source) and in which no correlation with biological properties is made: Appropriate organic chemistry section. (See C.1)
11. Mechanism of transcription of genes for endogenous immunological mediators when the interest is in the mechanism: Section 3: "Biochemical Genetics"
12. Role of lectins in plant physiology: Section 11: "Plant Biochemistry"
Structure elucidation and properties of lectins other than those associated with immunochemical reactions: Section 6: "General Biochemistry"
Determination and analysis of lectins when there is no immunological interest: Section 9: "Biochemical Methods"
Use of lectins as tools, in which there is no interest in an immunological process: Section appropriate to the process under study.
13. Therapeutic use of immune mediators, other than those endogenous to the host and pharmacology of antibody-drug conjugates: Section 1: "Pharmacology"
14. Catalytic antibodies: Section 7: "Enzymes"
15. Immune responses in plants: Section 11: "Plant Biochemistry"
Defense mechanisms solely among microbes: Section 10: "Microbial, Algal, and Fungal Biochemistry"
16. Studies on gene and genome structure and organization, including nucleic acid sequences of endogenous immunological mediators, in which protein sequences either are not reported or are incidental to the study: Section 3: "Biochemical Genetics"
17. Novel genetic methods including methods such as nucleic acid sequencing, molecular cloning, nucleic acid amplification (e.g., PCR), mutagenesis, gene mapping, hybridization, and introduction of foreign nucleic acid as well as genetic engineering methodology and the application of established methods in the development of genetically engineered organisms: Section 3: "Biochemical Genetics"
18. Studies emphasizing the chemical synthesis of immunological substances including nonindustrial syntheses using enzymes: Appropriate organic chemistry section or Section 78: "Inorganic Chemicals and Reactions" for inorganic syntheses. (See C.1)
19. Production of immunological substances of commercial interest by genetically engineered cells or organisms, fermentation procedures, or industrial production of immunological substances using enzymes: Section 16: "Fermentation and Bioindustrial Chemistry"

20. Methodology or comparison of organ function tests and immunological disease diagnosis based on nonroutine or comparative methods for detecting or determining:
Section 2: "Mammalian Hormones"
Section 7: "Enzymes"
Other endogenous nonimmunochemicals: Section 9: "Biochemical Methods"
Immunological disease diagnosis based on nonroutine or comparative genetic methods: Section 3: "Biochemical Genetics"
21. Excluded from coverage in CA:
- Immunological studies involving crude extracts or crude biological preparations.
 - Serological studies in which no new chemistry is involved, including purification of antibodies for which no specific antigen is identified, unless there is other biochemical characterization of the antibody.

C. Cross-References

- B.10, B.14 - Section 15: "Immunochemistry"
- A.15 - Section 3: "Biochemical Genetics"
- A.11 - Section 2: "Mammalian Hormones"
- A.1-A.3 - Studies where the emphasis is on the biological activity and in which synthetic data are also reported: Cross-refer to appropriate organic chemistry section or Section 78: "Inorganic Chemicals and Reactions"

D. Subsection Arrangement

- Reviews
- Methods (including analysis)
 - Analysis
 - Purification
 - Separation
- Adjuvants, antigens, haptens, and vaccines
 - Antigen receptors
 - Haptens
- Antibodies and immunoglobulins
- Complement
 - Complement system components
 - Complement binding proteins
 - Complement receptors
- Interferons and lymphokines
 - Colony stimulating factors
 - Cytokine receptors
 - Interferons
 - Interleukins
 - Perforins
- Phagocytosis

7. Immunogenetics
 - Gene therapy
 - Genetic translation
 - Recombination
 - RNA formation factors
8. Immunopathology
 - AIDS
 - Arthritis
 - Diabetes
 - Graft vs. host disease
 - Multiple sclerosis
 - Myasthenia gravis
9. Allergy and anaphylaxis
10. Other (immunity, immune suppression, tolerance, etc.)

Subsection hierarchy (most preferred to least preferred):

0 > 1 > 9 > 8 > 7 > 2 = 3 = 4 = 5 > 6 = 10

The subsection hierarchy should be based on the major point of the paper.

Section 16: Fermentation and Bioindustrial Chemistry

A. Coverage in This Section

1. Biochemistry of microbial fermentation processes of actual or potential commercial interest. (See B.1-B.5, B.13a)
2. Fermentative production of pharmaceutical materials (actual or potential), including working up, extraction, or derivative preparation of such materials from fermentations. (See B.8, B.9, B.10, C.1)
3. Fermentative production of microbial cells from which substances of commercial interest are prepared. (See B.10)
4. Analytical studies relating directly to fermentation. (See B.10)
5. Fermentation and enzymic processes for the commercial production of carbohydrates, acids, alcohols, nucleic acids, yeasts, and other industrial products. (See B.1, B.10, B.12)
6. Laboratory studies with stated commercial intent, or established commercial fermentation processes. (See B.1-B.5, B.13a,b)
7. The application of isolated or immobilized enzymes (regardless of origin) for the commercial modification or production of substances of special interest (e.g., alcohols, antibiotics, or steroids) to the fermentation industry. (See B.1, B.6, B.7, B.12)
8. Production of biochemicals of commercial interest (e.g., lymphokines, hormones, enzymes) by cells or organisms, including those that are genetically engineered. (See B.10, B.13a,b)
9. Microbial strain improvement for fermentation technology. (See B.10, B.13a,b)
10. Fermentative or enzymic production of polymers. (See B.11, C.3)

B. Alternative Placement and Exclusion from Coverage in CA

1. Application of microorganisms and isolated enzymes to food production, including food sugars, tea fermentation, vat cultivation of mushrooms, and the manufacture of dairy products, pickles, vinegar, soy sauce, and alcoholic beverages: Section 17: "Food and Feed Chemistry"
2. Tobacco fermentation: Section 11: "Plant Biochemistry"
3. Fermentations related to wastes, sewage, and sludge, in which there is no or only minor interest in the production or recovery of useful materials from the wastes: Section 60: "Waste Treatment and Disposal"
4. Fermentations as commercial energy sources, such as production of methane, which can be used as a fuel: Section 52: "Electrochemical, Radiational, and Thermal Energy Technology" (See C.2)
5. Compost fermentation: Section 19: "Fertilizers, Soils, and Plant Nutrition"
6. Pharmaceutical applications of enzymes: Section 63: "Pharmaceuticals"
7. Enzyme immobilization studies in which the major interest is in the enzyme or the immobilization process: Section 7: "Enzymes"
8. Studies reporting the details of the isolation and identification of antibiotics occurring in or produced by microorganisms, even when the studies include detailed structural elucidation and/or physicochemical analysis: Section 10: "Microbial, Algal, and Fungal Biochemistry"
9. Structural elucidation and/or physicochemical properties of antibiotics in which isolation procedures are not detailed (i.e., product has been isolated previously from that source) and in which no correlation with biological properties is made: Appropriate organic chemistry section.

10. Genetic methods including methods such as nucleic acid sequencing, molecular cloning, nucleic acid amplification (e.g., PCR), mutagenesis, gene mapping, hybridization, and introduction of foreign nucleic acid as well as genetic engineering methodology and the application of established methods in the development of genetically engineered organisms: Section 3: "Biochemical Genetics"
11. Industrial or nonindustrial production of polymers where the emphasis is on the product: Section 35: "Chemistry of Synthetic High Polymers"
12. Nonindustrial chemical syntheses of organic compounds which include an enzymic step: Appropriate organic chemistry section.
13. Excluded from coverage in CA:
 - a. Undefined fermentation products from impure, undefined growth media.
 - b. Culture media which exhibit stimulatory or inhibitory properties, but about which no chemical purification is reported or known substances implicated.

C. Cross-References

1. A.2 - Section 63: "Pharmaceuticals"
2. B.4 - Section 16: "Fermentation and Bioindustrial Chemistry"
3. A.10 - Section 35: "Chemistry of Synthetic High Polymers"

D. Subsection Arrangement

0. Reviews
1. Methods (including analysis)
2. Pharmaceuticals (including nutrients)
3. Plant cell culture
4. Macromolecules
5. Industrial chemicals
6. Animal cell culture
7. Single-cell protein and cell growth
8. Fermentation engineering
9. Other

Section 17: Food and Feed Chemistry

A. Coverage in This Section

1. Food chemistry, including physical, organic, inorganic, and analytical studies of human and animal food, model systems of food, and genetically engineered foods. (See B.1, B.12, and B.14)
2. Food additives and contaminants, including laws, regulations, and standards as promulgated through the Federal Register. (See C.1)
3. Toxicology of foods and nonnutrient food constituents.

These include:

- a. Effects, determinations, and contents of contaminants, additives, and residues. (See B.9, B.10)
- b. Safety evaluations, permissible levels, and tolerance limits. (See B.9, B.10)
- c. Levels of toxic substances in living organisms as a result of ingestion in foods. (See B.9, B.10)
- d. Cariogenicity of sugar substitutes and artificial sweeteners. (See B.16)
- e. Carcinogenic, teratogenic, and mutagenic, properties of foods or isolated nonnutrient chemicals of food interest. (See B.9, B.10)

Note: Author emphasis and other factors (e.g., publication in food-oriented journal) may be used as a guide to determine whether some systems (e.g., fish in the sea, vegetables in a garden) are to be considered as primarily of food interest or as physiological components of the environment. (See B.9-10)

4. Food allergies.
5. Materials and methods for food packaging, processing, preservation, and storage including pesticidal protection of foods after harvest. (See B.3, C.2)
6. Enzymic and fermentative manufacture of foods, such as alcoholic beverages, tea, pickles, vinegar, cheese, soy sauce, sauerkraut, mushrooms (vat cultivation), edible carbohydrates, and silage. (See B.4, B.7)
7. Edible fats and oils. (See B.5)
8. Food flavorings and food-related essential oils. (See B.6)
9. Food uses of carbohydrates. (See B.7)
10. Evaluation (chemical, enzymic) of the digestibility or nutritive value of foods or feed components in vitro or in nontarget animals. (See B.1)
11. FD&C dye analysis for impurities and intermediates.
12. Determination of enzymes in food, feeds and alcoholic beverages.
13. Synthesis of chemical components of foods, feeds, and alcoholic beverages including additives when the emphasis is on the role of the component in food and feed chemistry. (See B.15, C.4)

B. Alternative Placement and Exclusion from Coverage in CA

1. General nutritional studies in animals, including in vivo target animal evaluation of the nutritive value of components of foods and feeds: Section 18: "Animal Nutrition"
2. Radioactive fallout in food: Section 8: "Radiation Biochemistry"
3. Synthesis and fabrication of packaging and other materials intended for food use, without studying interactions with food or food models: Appropriate macromolecular or applied chemistry section.
4. Production and purification of microbes and microbial protein: Section 16: "Fermentation and Bioindustrial Chemistry"
5. Inedible fats and oils: Section 45: "Industrial Organic Chemicals, Leather, Fats, and Waxes"
6. Nonfood essential oils: Section 62: "Essential Oils and Cosmetics"
7. Nonfood uses and nonenzymic manufacture of cellulosic and industrial noncellulosic carbohydrates:

- Section 43: "Cellulose, Lignin, Paper, and Other Wood Products"
Section 44: "Industrial Carbohydrates"
8. Manufacture of emulsions and solutions for parenteral nutrition: Section 63: "Pharmaceuticals"
 9. General environmental toxicology not related to food: Section 4: "Toxicology"
 10. Toxicity of nutrients: Section 18: "Animal Nutrition"
 11. Physiology of smell and taste including structure-perception interactions: Organism-specific section.
 12. Structural elucidation and(or) physicochemical properties of natural products (other than proteins or nucleic acids, which remain in Section 17) from foods in which isolation procedures are not detailed (i.e., product has been isolated previously from that source) and in which no correlation with biological properties is made: Appropriate organic chemistry section. (See C.3)
 13. Lactose manufacture from whey: Section 44: "Industrial Carbohydrates"
 14. Genetic engineering methodology and the application of established methods in the development of genetically engineered organisms: Section 3: "Biochemical Genetics"
 15. Chemical syntheses of organic or inorganic compounds where the emphasis is the synthesis: Appropriate organic chemistry section or Section 78: "Inorganic Chemicals and Reactions" (See C.3)
 16. Cariogenicity of nutrients:
Section 18: "Animal Nutrition" Pathology of dental caries formation:
Section 14: "Mammalian Pathological Biochemistry" In vitro cariogenicity studies with isolated microorganisms and emphasis on microbial biochemistry:
Section 10: "Microbial, Algal, and Fungal Biochemistry"

C. Cross-References

1. A.2 -
Pesticide residues: Section 5: "Agrochemical Bioregulators"
Pharmaceutical residues: Section 1: "Pharmacology"
Other contaminants and pollutants: Section covering source of contamination.
2. A.5 - Food preservation by ionizing or electromagnetic radiation: Section 8: "Radiation Biochemistry"
3. B.12, B.15 - Section 17: "Food and Feed Chemistry"
4. A.13 - Studies where the emphasis is food and feed chemistry and in which synthetic data are also reported:
Cross-refer to appropriate organic chemistry section or Section 78: "Inorganic Chemicals and Reactions"

D. Subsection Arrangement

0. Reviews
1. Analysis
2. Physical, organic, and inorganic chemistry and model systems
3. Regulations and standards (including Federal Register)
4. Packaging, preservation, and processing
5. Contaminants and toxicants
6. Additives, sweeteners, flavorings, condiments, and confectionery
7. Meat, eggs, fish, and seafood
8. Dairy products (including butter)
9. Fats, oils, and margarine
10. Fruits, vegetables, legumes, and nuts
11. Cereals and bakery products
12. Feeds and animal foods
13. Beverages
14. Other

Section 18: Animal Nutrition

A. Coverage in This Section

1. General nutritional studies in all animal species, except protozoa, relating to metabolic and physiological effects of nutrients (vitamins, minerals, carbohydrates, lipids, proteins, and amino acids), including imbalances of, interrelations among, and bioavailability of nutrients. (See B.1, B.3, B.6-9)
2. Evaluation of the nutritive value of components of foods and feeds (digestibility coefficient, protein biological value, net and metabolizable energy) by experiments on target animals in vivo. (See B.2, B.13a)
3. Animal requirements and utilization of nutrients and of food or feed energy. (See B.1, B.3, B.5, B.7, B.13a)
4. Diseases recognized as resulting from nutritional disorders (e.g., starvation, nutritional aspects of obesity, malnutrition, specific nutrient deficiencies), including nutritional disorder diagnosis in which there is no interest in the methodology or comparison of organ function tests, in the methodology or comparison of chemical determination or detection methods, or in the methodology or comparison of genetic methods. (See B.6, B.12)
5. Therapeutic nutrition, including parenteral nutrition using vitamins, vitamin derivatives and analogs, and other nutrients. (See B.4, B.8, B.13b)
6. Dietary regimes supplemented with at least one purified compound.
7. Feeding trials on livestock in which growth stimulants (antibiotics, hormones, steroids, etc.) are fed, implanted, or injected to increase growth rate or the production of meat, eggs, wool, milk, and other animal products. (See B.13a)
8. Toxicology of nutrients (e.g., carcinogenicity, teratogenicity, cariogenicity and mutagenicity). (See B.11)
9. Nutritional effects on endogenous hormone regulation. (See C.1)

B. Alternative Placement and Exclusion from Coverage in CA

1. Intermediary metabolism of nutrients or their metabolites:
 - a. Nonmammals: Section 12: "Nonmammalian Biochemistry"
 - b. Mammals: Section 13: "Mammalian Biochemistry"
2. Evaluation of the nutritive value of components of foods or feeds by chemical, enzymic, or biological methods in vitro or in nontarget animals in vivo: Section 17: "Food and Feed Chemistry"
3. Food or feed studies unrelated to nutrition: Section 17: "Food and Feed Chemistry"
4. Manufacture or formulation of emulsions and solutions for parenteral nutrition: Section 63: "Pharmaceuticals"
5. Food toxicology: Section 17: "Food and Feed Chemistry"
6. Nonnutritional aspects of obesity and nutrient metabolic disorders (e.g., lactose malabsorption, phenylketonuria, and celiac disease): Section 14: "Mammalian Pathological Biochemistry"
7. Food allergies: Section 17: "Food and Feed Chemistry"
8. Nonnutritional, therapeutic use of vitamins, vitamin derivatives and analogs, and other nutrients: Section 1: "Pharmacology"
9. Genetic engineering methodology and the application of established methods in the development of genetically engineered organisms: Section 3: "Biochemical Genetics"
10. Production of biochemicals of commercial interest by genetically engineered cells or organisms: Section 16: "Fermentation and Bioindustrial Chemistry"
11. Cariogenicity of sugar substitutes and artificial sweeteners: Section 17: "Food and Feed Chemistry"
Pathology of dental caries formation: Section 14: "Mammalian Pathological Biochemistry"
In vitro cariogenicity studies with isolated microorganisms and emphasis on microbial biochemistry:

Section 10: "Microbial, Algal, and Fungal Biochemistry"

12. Methodology or comparison of organ function tests and nutritional disease diagnosis based on new diagnostic agents and/or nonroutine or comparative methods for detecting or determining:

Section 2: "Mammalian Hormones"

Section 7: "Enzymes"

Immunochemicals: Section 15: "Immunochemistry"

Other endogenous chemicals: Section 9: "Biochemical Methods"

Nutritional disease diagnosis based on nonroutine or comparative genetic methods: Section 3: "Biochemical Genetics"

13. Excluded from coverage in CA:

- a. Effects and utilization of chemically undefined foods in relation to animal growth, weight gain, or fertility.
- b. Clinical nutrition in which no chemistry is involved.

C. Cross-References

1. A.9 - Section 2: "Mammalian Hormones"

D. Subsection Arrangement

0. Reviews
1. Minerals
2. Vitamins
3. Proteins and nonprotein-nitrogen substances
4. Carbohydrates, fiber, and energy
5. Lipids
6. Nonnutrient growth and metabolic stimulants
7. Other

Section 19: Fertilizers, Soils, and Plant Nutrition

A. Coverage in This Section

1. Effects of chemically characterized synthetic and natural fertilizers and soil amendments, including genetically engineered organisms, on plant composition and metabolism and/or on soil composition and properties. (See B.13, B.15, B.19abc)
2. General methods applied to the determination of fertilizer composition.
3. Fertilizer and soil-amendment characteristics, technology, manufacture, synthesis, formulation, composting, and analysis. (See B.13, B.16, C.1)
4. Organic soil constituents. (See B.5, B.7)
5. Inorganic soil constituents. (See B.1, B.2, B.7, B.17-18, C.4)
6. Plant utilization of nutrients from the soil and from fertilizers including studies on genetically engineered plants. (See B.13-15, B.19abc)
7. Plant requirements for nutrients in relation to growth, yield, and plant composition including studies on genetically engineered plants. (See B.3, B.13-14, B.19abc)
8. Methods of analysis of soil constituents, added or naturally present. (See B.2, B.9, B.13, C.2)
9. Reclamation of soil for agricultural and related purposes, (e.g., revegetation) and its effect on plant biochemistry and on agricultural properties of soil. (See B.8, B.10, B.15)
10. Soil pollution and soil processes affecting pollutants in terrestrial ecosystems. (See B.5-7, B.11-12, B.14-15)
11. Conversion of inorganic or organic wastes into chemically defined fertilizers and soil amendments. (See B.19c)
12. Methods of interest in plant nutrition. (See B.4, B.13)

B. Alternative Placement and Exclusion from Coverage in CA

1. Inorganic soil constituents, naturally present in the soil, with no reference to agricultural interest: Section 53: "Mineralogical and Geological Chemistry"
2. Methods of analysis of inorganic soil constituents naturally present and not of agricultural interest: Section 79: "Inorganic Analytical Chemistry"
3. Metabolic and compositional studies on plant cell and tissue cultures: Section 11: "Plant Biochemistry"
4. Methodological studies with plant cell and tissue cultures: Section 9: "Biochemical Methods"
5. Biochemical studies on microorganisms isolated from soil: Section 10: "Microbial, Algal, and Fungal Biochemistry"
6. Controlled studies of toxic effects of pesticides and their residues on soil microorganisms: Section 4: "Toxicology"
7. Pesticide residues in soil: Section 5: "Agrochemical Bioregulators"
8. Materials used for the alteration of soil properties for nonagricultural purposes (e.g., road building): Appropriate materials section.
9. Biogeoprospecting: Section 53: "Mineralogical and Geological Chemistry"
10. Cleanup of waste-disposal sites and chemical spills: Section 60: "Waste Treatment and Disposal"
11. Groundwater and aquifer pollution: Section 61: "Water"
12. Pollutants in soil as indicators of air pollution: Section 59: "Air Pollution and Industrial Hygiene"
13. Genetic engineering methodology and the application of established methods in the development of genetically engineered organisms: Section 3: "Biochemical Genetics"
14. Controlled studies on the biological effects of soil pollution and studies of nonnutrient toxicology: Section 4: "Toxicology"

15. Metabolic studies of plant responses to soil stress, when the emphasis is on the plant: Section 11: "Plant Biochemistry"
16. Chemical syntheses where the emphasis is synthesis: Appropriate organic chemistry section or Section 78: "Inorganic Chemicals and Reactions" (See C.3)
17. Studies emphasizing radioelements in agricultural systems and in soils as part of a biological system: Section 8: "Radiation Biochemistry"
18. Nuclear technology studies of radioactive wastes in soils: Section 71: "Nuclear Technology"
19. Excluded from coverage in CA:
 - a. Effects of compost, manure, plant waste, sewage, etc., (even if chemical composition is defined) on plant growth and yield.
 - b. Effects of a single chemical fertilizer on plant growth and yield.
 - c. Fertilizers and soil amendments from waste materials with no chemical data provided.

C. Cross-References

1. A.3 - Studies where the emphasis is biological activity and in which synthetic data are also reported: Cross-refer to appropriate organic chemistry section or Section 78: "Inorganic Chemicals and Reactions"
2. A.8 -
Section 79: "Inorganic Analytical Chemistry"
Section 80: "Organic Analytical Chemistry"
3. B.16 - Section 19: "Fertilizers, Soils, and Plant Nutrition"
4. A.5 - Physicochemical reactions of isolated soil constituents: Section 78: "Inorganic Chemicals and Reactions" appropriate physical chemistry section.

D. Subsection Arrangement

0. Reviews
1. Methods (including analysis)
2. Soil composition, fertility, and physicochemistry
 - trace elements
 - macronutrients
 - organic constituents
 - other components of agricultural interest
 - biological activity
 - soil processes
3. Fertilizer-soil relations, including amendments
4. Plant-soil relations and terrestrial ecosystems
5. Plant-fertilizer-soil systems, including amendments
6. Fertilizer and soil amendment technology
7. Plant-nutrient relations
 - nutrition
 - hydroponics
 - nutrient toxicology

8. Irrigation and salinity (plant-water relations in agroecosystems)
9. Soil pollution
10. Isolated soil constituents (for studies of isolated materials in studies of agricultural interest)
 - humic acids
 - clay minerals
 - others
11. Other

Section 20: History, Education, and Documentation

A. Coverage in This Section

1. Reviews, literature surveys, bibliographies, discussions, etc., covering areas of general chemical interest.
2. Biographies and obituaries of well-known chemists of international stature. (See Introduction)
3. Awards (e.g., medals, prizes) limited to internationally recognized awards, those administered by the ACS or its divisions, and awards administered by ACS local sections, if the award is not limited to persons living within the area of the section.
4. Historical chemistry, including alchemy. (See C.1)
5. Archaeology, paleontology, and the chemistry of art and museum preservation. (See C.1)
6. Methods of analysis or preservation of archaeological artifacts and museum specimens. (See C.1)
7. Theories and methods of teaching chemistry, educational laboratory experiments, classroom demonstrations, and teaching equipment and its construction. (See C.1)
8. Chemical information, documentation, data processing, and computer applications in relation to these activities. (See B.1)
9. Units and systems of chemical measurement, notation, and nomenclature covering areas of general chemical interest. (See B.3)
10. General notes on chemical industry and economics. (See B.2) "Introduction"

B. Alternative Placement and Exclusion from Coverage in CA

1. Chemical information and computer applications related to the chemistry covered in a specific section: Section appropriate to the application.
2. Chemical industry and economic studies related to a specific substance or industry: Section appropriate to substance or industry, unless excluded from coverage as described in the Introduction.
3. Nomenclature rules for specific substances or classes: Section appropriate to the substance or class.

C. Cross-References

1. A.4-8 - Cross-refer to section pertaining to topic under consideration.

D. Subsection Arrangement

0. Reviews
1. Chemists
2. History
3. Archaeology, paleontology, art, and museums
4. Education
5. Chemical information, documentation, and data processing
6. Chemical industry and economics
7. Other

Section 21: General Organic Chemistry

A. Coverage in This Section

1. Reviews, discussions, and books of general interest to organic chemists.
2. General organic nomenclature, including computer applications.
3. General synthetic processes (e.g., hydrogenation, high-pressure synthesis), work-up procedures (e.g., preparative-scale chromatography), and reactions as applied to a wide variety of organic compound classes, including computer applications.
4. Organic compounds of unknown structure.

B. Alternative Placement and Exclusion from Coverage in CA

1. Physical organic studies of a general nature, including computer applications: Section 22: "Physical Organic Chemistry"
2. Manufacture and processing of industrial organic compounds with emphasis on manufacturing technology (i.e., studies with some evidence of large-scale manufacturing intent, such as studies on process optimization, process scale-up, engineering aspects of the process, product yield improvement, catalyst activity and selectivity, or apparatus): Section 45: "Industrial Organic Chemicals, Leather, Fats, and Waxes" (A List of Common Industrial Organic Compounds is appended to Section 45.)
3. Reviews and other studies of general interest in natural products chemistry: Section 26: "Biomolecules and Their Synthetic Analogs"

C. Cross-References

None

D. Subsection Arrangement

0. Reviews
1. Nomenclature
2. Synthetic methods
3. Other

Section 22: Physical Organic Chemistry

A. Coverage in This Section

1. Physical studies of organic chemical substances, the synthesis and reactions of which are found in Sections 21, 23, 24, 25, 27, and 28. Physical organic chemistry is defined as the science dealing with the mechanism of reactions and with the effect of structure and environment on chemical reactivity and properties by quantitative and mathematical methods. Where emphasis is on the reaction or process (e.g., mechanism kinetics, transition state, or reactivity) the abstract is found here. Where emphasis is on the physical chemical concept with application to chemistry in general, even though an organic compound is used as a model species, the abstract is placed in a physical chemistry section. The following statements further define and limit this coverage.
2. Studies in which the elucidation or discussion of mechanisms of reactions of organic compounds, using any technique available (kinetics, product analysis, study of intermediates, etc.), is a principal concern.
3. Mechanistic studies of electrochemical reactions of organic compounds. (See B.11, C.1)
4. Mechanistic studies of photochemical and radiochemical reactions of organic compounds where the interest is in the behavior of the organic compound and not in the physical aspects of the initial photochemical or radiochemical excitation process. (See B.12, C.5)
5. Studies primarily concerned with kinetic data (reaction orders, rate constants, activation parameters).
6. Thermodynamic studies where emphasis is on elucidation of the reaction, substituent effects, or structure-property relationships. (See B.8, C.2)
7. Correlation analysis (structure-reactivity correlations), e.g., Hammett and Taft correlations, steric effects, strain effects on reactivity.
8. Solvent effects, solvation, and cage effects related to reaction mechanisms.
9. Kinetic isotope effects on reactions.
10. Stereochemical inversions and retentions; mechanistic studies involving stereochemistry. (See B.3)
11. Mass spectral fragmentation mechanisms and cross-beam studies. (See B.4)
12. Catalytic studies of specific reactions in which emphasis is on the kinetics and mechanism of the catalytic reaction. (See B.5, C.3)
13. Equilibrium studies, including distribution functions, isomerism, tautomerism, protonation, charge transfer, electron exchange, and acid-base studies, in which the reaction is emphasized. (See B.10, C.4)
14. Property-structure correlations (e.g., electrical and magnetic properties, Kerr constants, dipole moments, dielectric constants). X-ray, electron, or neutron diffraction studies in which bond length and bond angle relations to hybridization are the main concerns. (See B.4)
15. Quantum mechanical and other theoretical mechanistic studies of reactions, processes, and structures.
16. Correlations between structure and spectral phenomena. (See B.6)
17. Optical rotatory dispersion (ORD), circular dichroism (CD), and magnetic ORD and CD spectral studies. (See B.6)
18. The basic theories of organic chemistry, including inductive, field, resonance, conjugative, and hyperconjugative effects, aromaticity, and strain effects.

B. Alternative Placement and Exclusion from Coverage in CA

1. Physical organic studies of organometallic and organometalloidal compounds, including selenium and tellurium compounds, and of natural products:
Section 26: "Biomolecules and Their Synthetic Analogs"
Section 29: "Organometallic and Organometalloidal Compounds"
Section 30: "Terpenes and Terpenoids"
Section 31: "Alkaloids"
Section 32: "Steroids"
Section 33: "Carbohydrates"
Section 34: "Amino Acids, Peptides, and Proteins" (See C.6)
2. Speculation about reaction mechanisms, catalyst activity, etc., not supported by experimental results; routine mechanistic rationalizations: Appropriate Synthetic Organic Section.
3. Stereoselective or stereospecific reactions or syntheses not concerned with mechanistic details: Appropriate Synthetic Organic Section.
4. Spectral, x-ray, and electron diffraction studies concerned only with structure elucidation: Appropriate Synthetic Organic Section.
5. Process optimization, catalyst activity, and reaction velocity studies containing no mechanistic implications: Appropriate Synthetic Organic Section.
6. Spectral studies in which no generalized structure-spectra relation is involved:
Section 73: "Optical, Electron, and Mass Spectroscopy and Other Related Properties"
Section 77: "Magnetic Phenomena"
7. The use of spectral methods and related optical properties in organic chemical analysis, as well as apparatus and spectrometers designed specifically for organic chemical analysis: Section 80: "Organic Analytical Chemistry"
8. Fundamental principles of thermodynamics and thermodynamic properties of organic compounds with no explicit relation to elucidation of structure, reaction, or reactivity: Section 69: "Thermodynamics, Thermochemistry, and Thermal Properties"
9. Physicochemical collective properties of organic substances (e.g., vapor pressure, melting point, viscosity) with no correlations between structure, reaction, or reactivity: Section 65: "General Physical Chemistry"
10. Phase equilibria and chemical equilibria of organic systems in gas, liquid, and solid phases in which there is no explicit correlation to chemical reactions: Section 68: "Phase Equilibria, Chemical Equilibria, and Solutions"
11. Electrochemical studies where emphasis is on theory, electrodes, electrochemical cells, etc., rather than on the reaction: Section 72: "Electrochemistry"
12. Radiochemical and photochemical studies of organic compounds when the interest is in the physical aspects of the process, particularly the dynamics of the initial excitation process: Section 74: "Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes" (See C.6)
13. Physical organic studies where explicit biological significance is stated: Appropriate Biochemistry Section.
14. Physical organic studies of pharmaceutical formulations, such as drug decomposition or solution rates: Section 63: "Pharmaceuticals"

C. Cross-References

1. A.3 - Section 72: "Electrochemistry"
2. A.6 - Section 69: "Thermodynamics, Thermochemistry, and Thermal Properties"
3. A.12 - Section 67: "Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms"
4. A.13 - Section 68: "Phase Equilibria, Chemical Equilibria, and Solutions"
5. A.4 - Section 74: "Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes"
6. B.1, B.12 - Section 22: "Physical Organic Chemistry"

D. Subsection Arrangement

0. Reviews
1. General
2. Theoretical organic chemical concepts, including quantum and molecular mechanical studies
3. Stereochemistry and stereochemical relationships, including conformational inversions and rotational isomerization
4. Addition, elimination, and substitution reactions
5. Ring formation, cleavage, enlargement, and contraction
6. Rearrangements, including isomerization and tautomerization
7. Oxidation-reduction, including dehydrogenation and hydrogenolysis
8. Degradation reactions, including mass spectral fragmentation
9. Absorption, emission, reflection, and scattering spectra (ultraviolet and visible, infrared and Fourier transform infrared, Raman, microwave, photoelectron, fluorescence, phosphorescence, etc.)
10. Resonance spectra (electron spin, nuclear magnetic and Fourier transform nuclear magnetic, quadrupole, etc.)
11. Optical rotatory dispersion and circular dichroism
12. Acid-base, tautomerism, and other equilibrium studies
13. Other reactions, processes, and spectra

Section 23: Aliphatic Compounds

A. Coverage in This Section

1. Synthesis, purification, stabilization, reactions, and determination of molecular structure of acyclic carbon compounds and biological activity of newly prepared compounds. (See C.1)
2. Studies in which electromagnetic radiation, an electrochemical process, or a biological system is used as a tool in synthesis of aliphatic compounds and in which the interest is in the product, not in the system used. (See B.12, B.13, B.14)

B. Alternative Placement and Exclusion from Coverage in CA

1. Physical organic studies of aliphatic compounds, e.g., mechanism, kinetics, transition state, or reactivity: Section 22: "Physical Organic Chemistry"
2. Cyclic derivatives of aliphatic acids (e.g., anhydrides, lactones, sultones, lactams, and sultams):
Appropriate Heterocyclic Compounds section (Section 27: "Heterocyclic Compounds (One Hetero Atom)", Section 28: "Heterocyclic Compounds (More Than One Hetero Atom)")
3. Preparation of methane and other hydrocarbons specifically for use as fuels or in fuel products by alkylation, conversion, cracking, hydroforming, hydrogenation, isomerization, reforming (platforms), and separation (molecular sieves): Section 51: "Fossil Fuels, Derivatives, and Related Products"
4. Compounds containing a carbon-metal or carbon-metalloid bond, including selenium and tellurium compounds: Section 29: "Organometallic and Organometalloidal Compounds"
5. Aliphatic esters of oxo acids of boron and Group 15 (VA) elements, e.g., phosphates, unless author interest is clearly on the aliphatic moiety: Section 29: "Organometallic and Organometalloidal Compounds"
6. Aliphatic natural products: Appropriate natural products section -
Section 26: "Biomolecules and Their Synthetic Analogs"
Section 30: "Terpenes and Terpenoids"
Section 31: "Alkaloids"
Section 33: "Carbohydrates"
Section 34: "Amino Acids, Peptides, and Proteins"
7. Preparation, processing, and properties of common monomers (See the List of Common Monomers appended to Section 35: Chemistry of Synthetic High Polymers") unless a nonpolymer application is explicitly stated: Appropriate Macromolecular Section.
8. Preparation, processing, and properties of common reagents for use in resin manufacture (e.g., pentaerythritol, trimethylolpropane), unless a nonpolymer application is explicitly stated: Section 37: "Plastics Manufacture and Processing"
9. Preparation, processing, and properties of common elastomer monomers (See the List of Common Monomers appended to Section 35: "Chemistry of Synthetic High Polymers") unless a nonelastomeric application is explicitly stated: Section 39: "Synthetic Elastomers and Natural Rubber"
10. Preparation, processing, and properties of novel monomers if a polymer application is explicitly stated: Appropriate Macromolecular Section.
11. Studies of aliphatic compounds as biological models, as metabolites or metabolic intermediates in biological systems, or where there is major emphasis on biological activity: Appropriate Biochemistry Section.
12. Chemical syntheses of aliphatic compounds in which an industrial enzymic or fermentation step is the point of the study: Section 16: "Fermentation and Bioindustrial Chemistry" (See C.2)
13. Electrochemical synthesis of aliphatic compounds when the interest is in the method, not the reaction product: Section 72: "Electrochemistry" (See C.2)

14. Reactions induced by electromagnetic radiation when the interest is in the changes effected by the radiation, not in the synthesis of a desired product:
Section 22: "Physical Organic Chemistry"
Section 74: "Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes"
15. Manufacture and processing of industrial aliphatic compounds not cited above with emphasis on manufacturing technology (i.e., studies with some evidence of large-scale manufacturing intent, such as studies on process optimization, process scale-up, engineering aspects of the process, product yield improvement, catalyst activity and selectivity, or apparatus): Section 45: "Industrial Organic Chemicals, Leather, Fats, and Waxes". A List of Common Industrial Organic Chemicals is appended to Section 45.
16. Synthesis of additives for lubricants, fuels, and other petroleum- and coal-related products, when the use is demonstrated: Section 51: "Fossil Fuels, Derivatives, and Related Products"
17. Salts of carboxylic acids and alcohols when the primary interest is not in the organic moiety:
Section 49: "Industrial Inorganic Chemicals"
Section 78: "Inorganic Chemicals and Reactions" (See C.2)

C. Cross-References

1. A.1 - Studies in which biological activity is also reported: cross-refer to the appropriate Biochemistry Section,
Section 1: "Pharmacology" for hormone analogs and hormone-like activity
Section 2: "Mammalian Hormones" for toxic substances, such as mutagens and carcinogens
Section 4: "Toxicology" for compounds with agricultural applications
Section 5: "Agrochemical Bioregulators" for enzyme analogs
Section 7: "Enzymes" for compounds tested on these organisms in vitro
Section 10: "Microbial, Algal, and Fungal Biochemistry" for data on drug formulations and drug physical properties
Section 63: "Pharmaceuticals"
2. B.12, B.13, B.17 - Section 23: "Aliphatic Compounds"

D. Subsection Arrangement

0. Reviews
1. General
2. Hydrocarbons
3. Halides and halonium compounds
4. Amines, amine oxides, imines, and quaternary ammonium compounds
5. Hydroxylamines, hydrazines, triazenes, azides, azines, and azo and diazo compounds
6. Nitro and nitroso compounds
7. Alcohols and thiols
8. Alcohol and thiol esters with inorganic acids
9. Ethers and sulfides
10. Peroxides and hydroperoxides
11. Sulfoxides and sulfones
12. Sulfenic, sulfinic, and sulfonic acids and derivatives
13. (This subsection discontinued)

14. Aldehydes and derivatives, including sulfur analogs
15. Ketones and derivatives, including sulfur analogs
16. Carboxylic acids and peroxy-carboxylic acids and their sulfur-containing analogs and salts
17. Esters, linear anhydrides, acyl peroxides, and acyl halides
18. Amides, amidines, imidic esters, hydrazides, and hydrazone esters
19. Nitriles, isonitriles, and acyl cyanides
20. Ureas, carbamic acids, guanidines, and their sulfur-containing analogs
21. Other

Section 24: Alicyclic Compounds

A. Coverage in This Section

1. Synthesis, purification, stabilization, reactions, and determination of molecular structure of alicyclic compounds (single, condensed, and spiro rings), and biological activity of newly prepared compounds. (See C.1)
2. Hydrogenated derivatives of polynuclear condensed benzene compounds not containing a benzene ring, e.g., octalin, decalin.
3. Annulenes, azulenes, fulvenes, fulvalenes, heptalenes, pentalenes, tropones, tropolones, tropylium, and similar compounds, but not their benzo analogs. (See B.7)
4. Hydrogenated fullerenes containing an organic substituent, but not containing a benzene ring. (See B.8)
5. Studies in which electromagnetic radiation, an electrochemical process, or a biological system is used as a tool in synthesis of alicyclic compounds and in which the interest is in the product, not in the system used. (See B.10, B.11, B.12)

B. Alternative Placement and Exclusion from Coverage in CA

1. Physical organic studies of alicyclic compounds, e.g., mechanism, kinetics, transition state, or reactivity: Section 22: "Physical Organic Chemistry"
2. Cyclic derivatives of acids (e.g., anhydrides, lactones, sultones, lactams, sultams): Appropriate Heterocyclic Compounds section (Section 27: "Heterocyclic Compounds (One Hetero Atom)", Section 28: "Heterocyclic Compounds (More Than One Hetero Atom)").
3. Alicyclic natural products: Appropriate Natural Products section -
Section 26: "Biomolecules and Their Synthetic Analogs"
Section 30: "Terpenes and Terpenoids"
Section 32: "Steroids"
Section 33: "Carbohydrates"
Section 34: "Amino Acids, Peptides, and Proteins"
4. Compounds containing a carbon-metal or carbon-metalloid bond, including selenium and tellurium compounds: Section 29: "Organometallic and Organometalloidal Compounds"
5. Alicyclic esters of oxo acids of boron and Group 15 (VA) elements, e.g., phosphates, unless author interest is clearly in the alicyclic moiety: Section 29: "Organometallic and Organometalloidal Compounds"
6. Cyclophanes: Section 25: "Benzene, Its Derivatives, and condensed Benzenoid Compounds"
7. Benzo analogs of annulenes, azulenes, fulvenes, tropones, and similar compounds: Section 25: "Benzene, Its Derivatives, and condensed Benzenoid Compounds"
8. Fullerenes and partially hydrogenated fullerenes containing an organic substituent and in which benzene rings are still present: Section 25: "Benzene, Its Derivatives, and condensed Benzenoid Compounds"
9. Studies of alicyclic compounds as biological models, as metabolites or metabolic intermediates in biological systems, or where there is major emphasis on biological activity: Appropriate Biochemistry Section.
10. Chemical syntheses of alicyclic compounds in which an industrial enzymic or fermentation step is the point of the study: Section 16: "Fermentation and Bioindustrial Chemistry" (See C.2)
11. Electrochemical synthesis of alicyclic compounds when the interest is in the method, not the reaction product: Section 72: "Electrochemistry" (See C.2)

12. Reactions induced by electromagnetic radiation when the interest is in the changes effected by the radiation, not in the synthesis of a desired product:
Section 22: "Physical Organic Chemistry"
Section 74: "Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes"
13. Preparation, processing, and properties of common monomers (See the List of Common Monomers appended to Section 35: "Chemistry of Synthetic High Polymers") unless a nonpolymer application is explicitly stated:
Appropriate Macromolecular section.
14. Preparation, processing, and properties of novel monomers if a polymer application is explicitly stated:
Appropriate Macromolecular Section.
15. Manufacture and processing of industrial alicyclic compounds with emphasis on manufacturing technology (i.e., studies with some evidence of large-scale manufacturing intent, such as studies on process optimization, process scale-up, engineering aspects of the process, product yield improvement, catalyst activity and selectivity, or apparatus): Section 45: "Industrial Organic Chemicals, Leather, Fats, and Waxes" A List of Common Industrial Organic Chemicals is appended to Section 45.

C. Cross-References

1. A.1 - Studies in which biological activity is also reported: cross-refer to the appropriate Biochemistry section, for pharmacological activity
Section 1: "Pharmacology" for hormone analogs and hormone-like activity
Section 2: "Mammalian Hormones" for toxic substances, such as mutagens and carcinogens
Section 4: "Toxicology" for compounds with agricultural applications
Section 5: "Agrochemical Bioregulators" for enzyme analogs
Section 7: "Enzymes" for compounds tested on these organisms in vitro
Section 10: "Microbial, Algal, and Fungal Biochemistry" for data on drug formulations and drug physical properties
Section 63: "Pharmaceuticals"
2. B.10, B.11 - Section 24: "Alicyclic Compounds"

D. Subsection Arrangement

0. Reviews
1. General
2. Cyclopropanes
3. Cyclobutanes
4. Cyclopentanes, including fulvenes and fulvalenes
5. Cyclohexanes
6. Higher members, including annulenes, tropones, tropolones, and tropylium compounds
7. Bicyclic compounds, including azulenes, heptalenes, and pentalenes
8. Tricyclic compounds and higher analogs, including adamantanes, fullerenes
9. Spiro compounds

Section 25: Benzene, Its Derivatives, and Condensed Benzenoid Compounds

A. Coverage in This Section

1. Synthesis, purification, stabilization, reactions, and determination of molecular structure of benzene, its derivatives, and condensed benzenoid compounds and biological activity of newly synthesized compounds. (Condensed benzenoid compounds are carbocyclic compounds having at least one fusion of two rings; at least one of the rings is a benzene ring.) (See C.1)
2. Studies in which electromagnetic radiation, an electrochemical process, or a biological system is used as a tool in synthesis of aromatic compounds and in which the interest is in the product, not in the system used. (See B.14, B.15)
3. Preparation and reactions of fullerenes containing an organic substituent. (See B.12).
4. Benzo analogs of annulenes, azulenes, fulvenes, tropones, and similar compounds. (See B.9)
5. Cyclophanes.

B. Alternative Placement and Exclusion from Coverage in CA

1. Physical organic studies of benzene, its derivatives, and condensed benzenoid compounds, e.g., mechanism, kinetics, transition state, or reactivity: Section 22: "Physical Organic Chemistry."
2. Cyclic derivatives of acids (e.g., anhydrides, lactones, sultones, lactams, and sultams): Appropriate Heterocyclic Compounds section (Section 27: "Heterocyclic Compounds (One Hetero Atom)", Section 28: "Heterocyclic Compounds (More Than One Hetero Atom)").
3. Organic natural products containing benzene and condensed benzene rings: Appropriate natural product section -
Section 26: "Biomolecules and Their Synthetic Analogs"
Section 30: "Terpenes and Terpenoids"
Section 31: "Alkaloids"
Section 32: "Steroids"
Section 33: "Carbohydrates"
Section 34: "Amino Acids, Peptides, and Proteins".
4. Preparation of benzene and its derivatives specifically for use as or in fuel products: Section 51: "Fossil Fuels, Derivatives, and Related Products".
5. Compounds, including fullerenes, containing a carbon-metal or carbon-metalloid bond, including selenium and tellurium compounds: Section 29: "Organometallic and Organometalloidal Compounds"
6. Phenyl esters, and condensed benzenoid esters of oxo acids of boron and Group 15 (VA) elements, e.g., phosphates, unless author interest is clearly in the benzene moiety: Section 29: "Organometallic and Organometalloidal Compounds"
7. Preparation, processing, and properties of common monomers (See the List of Common Monomers appended to Section 35: "Chemistry of Synthetic High Polymers") unless a nonpolymer application is explicitly stated: Appropriate Macromolecular Section.
8. Preparation, processing, and properties of novel monomers if a polymer application is explicitly stated: Appropriate Macromolecular Section.
9. Azulenes, fulvenes, fulvalenes, heptalenes, pentalenes, tropones, tropolones, tropylium, and similar nonbenzenoid, carbocyclic, possibly aromatic compounds: Section 24: "Alicyclic Compounds"
10. Preparation, purification, and stabilization of dye intermediates if the dye application is explicitly stated: Section 41: "Dyes, Organic Pigments, Fluorescent Brighteners, and Photographic Sensitizers"
11. Hydrogenated polynuclear benzenoid compounds containing no benzene ring: Section 24: "Alicyclic Compounds"

12. Fullerenes containing an organic substituent that are fully hydrogenated or partially hydrogenated and the author's structure shows that there are no benzene rings present: Section 24: "Alicyclic Compounds". Fullerenes not containing an organic substituent: Section 78: "Inorganic Chemicals and Reactions" or Section 49: "Industrial Inorganic Chemicals"
13. Studies of benzene and condensed benzenoid compounds as biological models, as metabolites or metabolic intermediates in biological systems, or where there is major emphasis on biological activity: Appropriate Biochemistry Section.
14. Chemical syntheses of aromatic compounds in which an industrial enzymic or fermentation step is the point of the study: Section 16: "Fermentation and Bioindustrial Chemistry" (See C.2)
15. Electrochemical synthesis of aromatic compounds when the interest is in the method, not the reaction product: Section 72: "Electrochemistry" (See C.2)
16. Reactions induced by electromagnetic radiation when the interest is in the changes effected by the radiation, not in the synthesis of a desired product:
Section 22: "Physical Organic Chemistry"
Section 74: "Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes"
17. Manufacture and processing of industrial aromatic compounds not cited above with emphasis on manufacturing technology (i.e., studies with some evidence of large-scale manufacturing intent, such as studies on process optimization, process scale-up, engineering aspects of the process, product yield improvement, catalyst activity and selectivity, or apparatus): Section 45: "Industrial Organic Chemicals, Leather, Fats, and Waxes". A List of Common Industrial Organic Chemicals is appended to Section 45.
18. Synthesis of additives for lubricants, fuels, and other petroleum- and coal-related products, when the use is demonstrated: Section 51: "Fossil Fuels, Derivatives, and Related Products"
19. Salts of carboxylic acids and alcohols when the primary interest is not in the organic moiety:
Section 49: "Industrial Inorganic Chemicals"
Section 78: "Inorganic Chemicals and Reactions" (See C.2)

C. Cross-References

1. A.1 - Studies in which biological activity is also reported: cross-refer to the appropriate Biochemistry Section, e.g.,
Section 1: "Pharmacology" for pharmacological activity
Section 2: "Mammalian Hormones" for hormone analogs and hormone-like activity
Section 4: "Toxicology" for toxic substances, such as mutagens and carcinogens
Section 5: "Agrochemical Bioregulators" for compounds with agricultural applications
Section 7: "Enzymes" for enzyme analogs
Section 10: "Microbial, Algal, and Fungal Biochemistry" for compounds tested on these organisms in vitro
Section 63: "Pharmaceuticals" for data on drug formulations and drug physical properties
2. B.14, B.15, B.19 - Section 25: "Benzene, Its Derivatives, and condensed Benzenoid Compounds"

D. Subsection Arrangement

0. Reviews
1. General
Benzene and its Derivatives
2. Hydrocarbons (saturated and unsaturated side chains)
3. Halides and halonium compounds
4. Amines, amine oxides, imines, and quaternary ammonium compounds
5. Hydroxylamines, hydrazines, triazenes, azides, azines, and azo and diazo compounds
6. Nitro and nitroso compounds

7. Alcohols and thiols
8. Alcohol and thiol esters with inorganic acids
9. Ethers, sulfides, and the corresponding onium compounds
10. Phenols, thiophenols, and derivatives including phenol and thiophenol ethers and esters
11. Peroxides and hydroperoxides
12. Sulfoxides and sulfones
13. Sulfenic, sulfinic, and sulfonic acids and derivatives
14. (This subsection discontinued)
15. Aldehydes and derivatives, including sulfur analogs
16. Ketones and derivatives, including quinones and sulfur analogs
17. Carboxylic acids and peroxycarboxylic acids and their sulfur-containing analogs and salts
18. Esters, acyl peroxides, acyl halides
19. Amides, amidines, imidic esters, hydrazides, and hydrazone esters
20. Nitriles, isonitriles, and acyl cyanides
21. Ureas, carbamic acids, guanidines, and their sulfur-containing analogs
22. Others

Condensed Benzenoid Compounds

23. Benzocyclopropenes, benzocyclobutenes, and indenenes
24. Naphthalenes
25. Benzotropolones and other bicyclic ring systems
26. Dibenzocyclobutenes, acenaphthenes, fluorenes, and their benzo analogs, such as fluoranthenes
27. Anthracenes and phenanthrenes
28. Other tricyclic and multicyclic six-membered ring systems, including trypticenes and helicenes
29. Higher-membered ring systems, including cyclophanes and fullerenes

Section 26: Biomolecules and Their Synthetic Analogs

A. Coverage in This Section

1. Synthesis, reactions, activity, and determination of molecular structure of naturally occurring compounds, usually with physiological activity, including analogs and intermediates in their synthesis, but excluding natural products placed in more specific sections. (See C.1)
2. Pheromones and artificial sex attractants, unless the emphasis is on the agricultural use. (See B.12-B.15, C.1)
3. Prostaglandins, leukotrienes, thromboxanes, compounds included in the arachidonic acid cascade and related biological processes, other fatty acids (i.e., linear aliphatic acids which contain 6 or more carbon atoms and which may contain one or more double or triple bonds) and their derivatives, such as ceramides. (See B.12-B.18, C.1)
4. Flavonoids and natural coumarins, furocoumarins, pyranocoumarins, naphthocoumarins. (See B.12-B.15, C.1)
5. Beta-lactam fungal metabolites. (See B.12-B.15, C.1)
6. Other bacterial and fungal metabolites without regard to biological activity. (See B.12-B.15, C.1)
7. Corrinoids, porphyrins, bilines. Phthalocyanines when specifically studied as porphyrin analogs. (See B.9, B.12-B.15, C.1)
8. Vitamins B1, B3, B4, B6, B7, biotin and their derivatives. (See B.12-B.15, C.1)
9. Purines, pyrimidine bases for nucleosides, other natural bases including theophylline, caffeine, other biogenic amines, e.g., tyramine. (See B.12-B.15, C.1)
10. Flavins, lumazines, other pteridines, and their aza and deaza analogs. (See B.12-B.15, C.1)
11. Lignin-related phenolic compounds, lignans, alkenynoic acids and related compounds from plants, other plant-derived compounds without regard to biological activity. (See B.12-B.15, C.1)
12. Animal-derived compounds without regard to biological activity. (See B.12-B.15, C.1)
13. Physical organic studies of the above-mentioned biomolecules, where no biological significance is stated. (See B.11, C.2)
14. Studies in which electromagnetic radiation, an electrochemical process, or a biological system is used as a tool in synthesis of biomolecules and their synthetic analogs and in which the interest is in the product, not in the system used. (See B.14, B.15)
15. Reviews and other studies of general interest in natural products chemistry, i.e., those documents that contain material appropriate to more than two of the sections 26 and 30-34:
Section 26: "Biomolecules and Their Synthetic Analogs"
Section 30: "Terpenes and Terpenoids"
Section 31: "Alkaloids"
Section 32: "Steroids"
Section 33: "Carbohydrates"
Section 34: "Amino Acids, Peptides, and Proteins"

B. Alternative Placement and Exclusion from Coverage in CA

1. Common biomolecules (e.g., ethanol, citric acid, linoleic acid, coumarin, and furfural) when the interest in these compounds is not as biomolecules: Section appropriate to the study.
2. Enzymes: Section 7: "Enzymes"
3. Terpenoids: Section 30: "Terpenes and Terpenoids"
4. Alkaloids: Section 31: "Alkaloids"
5. Steroids: Section 32: "Steroids"
6. Carbohydrates: Section 33: "Carbohydrates"

7. Nucleosides, nucleotides, and nucleic acids: Section 33: "Carbohydrates"
8. Amino acids, peptides, and proteins: Section 34: "Amino Acids, Peptides, and Proteins"
9. Porphyrin complexes when the emphasis is on the complex, not on the preparation of the porphyrin ligand:
Section 78: "Inorganic Chemicals and Reactions" or other Physical Chemistry section appropriate to the data being reported.
Model studies of hemoglobin-type functions: Section 6: "General Biochemistry"
Model studies of photosynthetic processes: Section 11: "Plant Biochemistry"
Porphyrin catalysts: Section appropriate to the reaction under study.
Phthalocyanines, unless studied specifically as porphyrin analogs in a study appropriately placed in this section:
Section 41: "Dyes, Organic Pigments, Fluorescent Brighteners, and Photographic Sensitizers" or other section appropriate to the study.
10. Pyrethroids, chrysanthemic acid derivatives, and related cyclopropanecarboxylates that have insecticidal activity:
Section 30: "Terpenes and Terpenoids"
11. Physical organic studies where biological significance is stated: Appropriate Biochemistry Section.
12. Isolation studies of biomolecules and studies in which both the first isolation of a biomolecule and characterization or structure elucidation are reported: Appropriate Biochemistry Section. (See C.3)
13. Studies of biomolecules and their synthetic analogs as biological models, as metabolites or metabolic intermediates in biological systems, or where there is major emphasis on biological activity: Appropriate Biochemistry Section.
14. Chemical syntheses of natural products in which an industrial enzymic or fermentation step is the point of the study: (See C.3) Section 16: "Fermentation and Bioindustrial Chemistry"
15. Electrochemical synthesis of biomolecules and their analogs when the interest is in the method, not the reaction product: Section 72: "Electrochemistry" (See C.3)
16. Chemistry (including synthesis) of synthetic glycerides and waxes as products of fats and oils: Section 45: "Industrial Organic Chemicals, Leather, Fats, and Waxes"
17. Chemistry of fatty acids as products of fats and oils, including their synthesis by saponification of glyceridic fats and oils: Section 45: "Industrial Organic Chemicals, Leather, Fats, and Waxes"
18. Manufacture and processing of industrial biomolecules with emphasis on manufacturing technology (i.e., studies with some evidence of large-scale manufacturing intent, such as studies on process optimization, process scale-up, engineering aspects of the process, product yield improvement, catalyst activity and selectivity, or apparatus): Section 45: "Industrial Organic Chemicals, Leather, Fats, and Waxes". A List of Common Industrial Organic Chemicals is appended to Section 45.

C. Cross-References

1. A.1-A.12 - Studies in which biological activity is also reported: cross-refer to the appropriate Biochemistry Section, e.g.,
Section 1: "Pharmacology" for pharmacological activity
Section 2: "Mammalian Hormones" for hormone analogs and hormone-like activity
Section 4: "Toxicology" for toxic substances, such as mutagens and carcinogens
Section 5: "Agrochemical Bioregulators" for compounds with agricultural applications
Section 7: "Enzymes" for enzyme analogs
Section 10: "Microbial, Algal, and Fungal Biochemistry" for compounds tested on these organisms in vitro
Section 63: "Pharmaceuticals" for data on drug formulations and drug physical properties
2. A.13 - Section 22: "Physical Organic Chemistry"
3. B.12, B.14, and B.15 - Section 26: "Biomolecules and Their Synthetic Analogs"

D. Subsection Arrangement

0. Reviews
1. General
2. Pheromones and sex hormones
3. Prostaglandins and other arachidonic acid cascade substances, thromboxanes, fatty acids
4. Flavonoids and natural coumarins and fused coumarins
5. Beta-lactam fungal metabolites
6. Other bacterial and fungal metabolites
7. Corrinoids, porphyrins, and bilines
8. Vitamins B1, B3, B4, B6, B7, biotin and their derivatives
9. Others, including purines, pyrimidine nucleic acid bases, flavins, lignans

Section 27: Heterocyclic Compounds (One Hetero Atom)

A. Coverage in This Section

1. Synthesis, purification, stabilization, reactions, and determination of molecular structure of cyclic compounds which contain two or more carbon atoms in a single ring and one hetero atom (nitrogen, oxygen, sulfur, or the halogens), including biological activity of newly prepared compounds. (See C.1)
2. Cyclic derivatives of acids, such as cyclic esters, imides, or anhydrides, containing one hetero atom. (See C.1)
3. Condensed cyclic compounds containing one hetero atom, including bridging or bridgehead positions. (See C.1)
4. Spiro compounds with one hetero atom in each ring. (See C.1)
5. Studies in which electromagnetic radiation, an electrochemical process, or a biological system is used as a tool in synthesis of heterocyclic compounds and in which the interest is in the product, not in the system used. (See B.8, B.9, B.10)

B. Alternative Placement and Exclusion from Coverage in CA

1. Physical organic studies of heterocyclic compounds, e.g., mechanism, kinetics, transition state, or reactivity:
Section 22: "Physical Organic Chemistry"
2. Organic natural products containing heterocyclic moieties: Appropriate Natural Product Section -
Section 26: "Biomolecules and Their Synthetic Analogs"
Section 30: "Terpenes and Terpenoids"
Section 31: "Alkaloids"
Section 32: "Steroids"
Section 33: "Carbohydrates"
Section 34: "Amino Acids, Peptides, and Proteins"
3. Condensed heterocyclic compounds containing two hetero atoms, one per ring: Section 28: "Heterocyclic Compounds (More Than One Hetero Atom)"
4. Compounds containing a carbon-metal or carbon-metalloid bond, including selenium and tellurium compounds:
Section 29: "Organometallic and Organometalloidal Compounds"
5. Studies on the preparation, processing, and properties of common monomers (See the List of Common Monomers appended to Section 35: "Chemistry of Synthetic High Polymers") unless a nonpolymer application is explicitly stated: Appropriate Macromolecular Section.
6. Preparation, processing, and properties of novel monomers if a polymer application is explicitly stated:
Appropriate Macromolecular Section.
7. Studies of heterocyclic compounds as biological models, as metabolites or metabolic intermediates in biological systems, or where there is major emphasis on biological activity: Appropriate Biochemistry Section.
8. Chemical syntheses of heterocyclic compounds in which an industrial enzymic or fermentation step is the point of the study: Section 16: "Fermentation and Bioindustrial Chemistry" (See C.2)
9. Electrochemical synthesis of heterocyclic compounds when the interest is in the method, not the reaction product: Section 72: "Electrochemistry" (See C.2)
10. Reactions induced by electromagnetic radiation when the interest is in the changes effected by the radiation, not in the synthesis of a desired product:
Section 22: "Physical Organic Chemistry"
Section 74: "Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes"

11. Manufacture and processing of industrial heterocyclic compounds not cited above with emphasis on manufacturing technology (i.e., studies with some evidence of large-scale manufacturing intent, such as studies on process optimization, process scale-up, engineering aspects of the process, product yield improvement, catalyst activity and selectivity, or apparatus): Section 45: "Industrial Organic Chemicals, Leather, Fats, and Waxes". A List of Common Industrial Organic Chemicals is appended to Section 45.
12. Synthesis of additives for lubricants, fuels, and other petroleum- and coal-related products, when the use is demonstrated: Section 51: "Fossil Fuels, Derivatives, and Related Products"

C. Cross-References

1. A.1-A.4 - Studies in which biological activity is also reported: cross-refer to the appropriate Biochemistry Section, e.g.,
 - Section 1: "Pharmacology" for pharmacological activity
 - Section 2: "Mammalian Hormones" for hormone analogs and hormone-like activity
 - Section 4: "Toxicology" for toxic substances, such as mutagens and carcinogens
 - Section 5: "Agrochemical Bioregulators" for compounds with agricultural applications
 - Section 7: "Enzymes" for enzyme analogs
 - Section 10: "Microbial, Algal, and Fungal Biochemistry" for compounds tested on these organisms in vitro
 - Section 63: "Pharmaceuticals" for data on drug formulations and drug physical properties
2. B.8, B.9 - Section 27: "Heterocyclic Compounds (One Hetero Atom)"

D. Subsection Arrangement

0. Reviews
1. General
2. Ethylene oxides
3. Ethylenimines
4. Ethylene sulfides and other 3-membered rings
5. 4-Membered rings
6. Furans
7. Areno- and diarenofurans
8. Thiophenes
9. Areno- and diarenothiophenes
10. Pyrroles and pyrrolizines
11. Indoles, indolizines, carbazoles, and other arenopyrroles
12. Other 5-membered rings
13. Pyrans
14. Benzopyrans (including coumarins, isocoumarins, chromones, benzopyrones, dibenzopyrans, and other arenopyrans)
15. Thiopyrans and areno- and diarenothiopyrans
16. Pyridines
17. Quinolines and isoquinolines
18. Other areno- and diarenopyridines (acridines, quinolizines, etc.)
19. Other 6-membered rings
20. Spiro compounds with one hetero atom in each ring
21. Higher-membered rings

Section 28: Heterocyclic Compounds (More Than One Hetero Atom)

A. Coverage in This Section

1. Synthesis, purification, stabilization, reactions, and determination of molecular structure of cyclic compounds which contain one or more carbon atoms in a single ring and a total of two or more hetero atoms (nitrogen, oxygen, sulfur, or the halogens), including biological activity of newly synthesized compounds. (See C.1)
2. Cyclic derivatives of acids, such as cyclic esters, imides, or anhydrides, and of masked carbonyl compounds, such as ketals, containing two or more hetero atoms, regardless of author nomenclature. (See C.1)
3. Synthesis, purification, stabilization, reactions, and determination of molecular structures of heterocyclic compounds containing only nitrogen, oxygen, sulfur, or the halogens in the rings and having C-containing moieties attached to the rings. (See B.4)
4. Studies in which electromagnetic radiation, an electrochemical process, or a biological system is used as a tool in synthesis of heterocyclic compounds and in which the interest is in the product, not in the system used. (See B.8, B.9, B.10)

B. Alternative Placement and Exclusion from Coverage in CA

1. Physical organic studies of heterocyclic compounds, e.g., mechanism, kinetics, transition state, or reactivity: Section 22: "Physical Organic Chemistry"
2. Compounds containing a carbon-metal or carbon-metalloid bond, including selenium and tellurium compounds: Section 29: "Organometallic and Organometalloidal Compounds"
3. Cyclic esters of oxo acids of boron and Group 15 (VA) elements, e.g., cyclic phosphates: Section 29: "Organometallic and Organometalloidal Compounds"
4. Heterocycles of the type described in A.3 but without C-containing moieties attached to the rings: Section 78: "Inorganic Chemicals and Reactions"
5. Organic natural products containing heterocyclic moieties: Appropriate Natural Product section -
Section 26: "Biomolecules and Their Synthetic Analogs"
Section 30: "Terpenes and Terpenoids"
Section 31: "Alkaloids"
Section 32: "Steroids"
Section 33: "Carbohydrates"
Section 34: "Amino Acids, Peptides, and Proteins"
6. Nucleosides and nucleotides and their carbocyclic and acyclic analogs: Section 33: "Carbohydrates"
Nucleic acid bases: Section 26: "Biomolecules and Their Synthetic Analogs"
7. Studies of heterocyclic compounds as biological models, as metabolites and metabolic intermediates in biological systems, or where there is major emphasis on biological activity: Appropriate Biochemistry Section.
8. Chemical syntheses of heterocyclic compounds in which an industrial enzymic or fermentation step is the point of the study: Section 16: "Fermentation and Bioindustrial Chemistry" (See C.2)
9. Electrochemical synthesis of heterocyclic compounds when the interest is in the method, not the reaction product: Section 72: "Electrochemistry" (See C.2)

10. Reactions induced by electromagnetic radiation when the interest is in the changes effected by the radiation, not in the synthesis of a desired product:
Section 22: "Physical Organic Chemistry"
Section 74: "Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes"
11. Studies on the preparation, processing, and properties of common monomers (See the List of Common Monomers appended to Section 35: "Chemistry of Synthetic High Polymers" unless a nonpolymer application is explicitly stated: Appropriate Macromolecular Section.
12. Preparation, processing, and properties of novel monomers if a polymer application is explicitly stated: Appropriate Macromolecular Section.
13. Manufacture and processing of industrial heterocyclic compounds with emphasis on manufacturing technology (i.e., studies with some evidence of large-scale manufacturing intent, such as studies on process optimization, process scale-up, engineering aspects of the process, product yield improvement, catalyst activity and selectivity, or apparatus): Section 45: "Industrial Organic Chemicals, Leather, Fats, and Waxes". A List of Common Industrial Organic Chemicals is appended to Section 45.
14. Synthesis of additives for lubricants, fuels, and other petroleum- and coal-related products, when the use is demonstrated: Section 51: "Fossil Fuels, Derivatives, and Related Products"

C. Cross-References

1. A.1, A.2 - Studies in which biological activity is also reported: cross-refer to the appropriate Biochemistry Section, e.g.,
Section 1: "Pharmacology" for pharmacological activity
Section 2: "Mammalian Hormones" for hormone analogs and hormone-like activity
Section 4: "Toxicology" for toxic substances, such as mutagens and carcinogens
Section 5: "Agrochemical Bioregulators" for compounds with agricultural applications
Section 7: "Enzymes" for enzyme analogs
Section 10: "Microbial, Algal, and Fungal Biochemistry" for compounds tested on these organisms in vitro
Section 63: "Pharmaceuticals" for data on drug formulations and drug physical properties
2. B.8, B.9 - Section 28: "Heterocyclic Compounds (More Than One Hetero Atom)"

D. Subsection Arrangement

0. Reviews
1. General
2. Fused-ring systems with two or more hetero atoms, no more than one hetero atom per ring
3. 3-Membered rings
4. 4-Membered rings
5. Dioxoles, oxathioles, dithioles
6. Oxazoles, isoxazoles
7. Thiazoles, isothiazoles
8. Pyrazoles
9. Imidazoles
10. Other 5-membered rings, two or more hetero atoms
11. Dioxanes
12. Oxathianes, dithianes
13. Oxazines (including morpholine)
14. Thiazines
15. Pyridazines, cinnolines, and phthalazines
16. Pyrimidines and quinazolines

17. Pyrazines and quinoxalines (including piperazines)
18. Other 6-membered rings, two hetero atoms
19. Triazines
20. Other 6-membered rings, three or more hetero atoms
21. Diazepines
22. Other 7-membered rings
23. Eight- and higher-membered rings

Section 29: Organometallic and Organometalloidal Compounds

A. Coverage in This Section

1. Synthesis, stabilization, purification, reactions, and determination of molecular structure of compounds which contain one or more carbon-metal or carbon-metalloid covalent (σ and π) bonds, including selenium and tellurium compounds and including biological activity of newly prepared compounds. (See B.1, C.1)
2. Organic derivatives of oxo acids of boron and Group 15 (VA) elements containing a carbon-metal bond, e.g., phosphonates, or no carbon-metal bond, e.g., phosphates. (See B.2, C.1)
3. Physical organic studies of organometallic and organometalloidal compounds. (See C.2)
4. Metal heterocycles containing no carbon-metal bond in the heterocyclic ring, but containing a substituent bonded to the heterocyclic ring through carbon, e.g., borazines, cyclic phosphazenes, cyclotrisiloxanes, or homocycles, such as cyclopentagermane.
5. Cluster compounds containing a substituent bonded to the core metal through carbon.
6. Fullerene complexes containing a carbon-metal bond.
7. Studies in which electromagnetic radiation, an electrochemical process, or a biological system is used as a tool in synthesis of organometallic compounds and in which the interest is in the product, not in the system used. (See B.9, B.11)

B. Alternative Placement and Exclusion from Coverage in CA

1. Nitrogen, oxygen, sulfur, and the halogens are not considered metals or metalloids.
2. Derivatives of oxo acids of boron and Group 15 (VA) elements that are prepared as characterizing derivatives or in which author interest is clearly in the organic moiety: Appropriate Organic Chemistry Section.
3. Synthesis and reactions involving organometallic intermediates, e.g., Grignard and Wittig reagents, unless author interest is in the preparation and properties of the intermediates: Appropriate Organic Chemistry Section based on the products.
4. Metal carbonyls, cyanides, carbides, and cyanates in the absence of other carbon-bonded ligands:
Section 49: "Industrial Inorganic Chemicals"
Section 78: "Inorganic Chemicals and Reactions"
5. Organometallic coordination compounds in which the emphasis is on the preparation and properties of the organic ligand: Appropriate Organic Chemistry Section.
6. Coordination compounds or chelates containing (a) no metal-carbon bond to the central metal(s); (b) ligands containing a Group 14 (IVA), Group 15 (VA), or boron atom bonded to carbon but no author emphasis on the preparation or properties of such ligands:
Section 49: "Industrial Inorganic Chemicals"
Section 78: "Inorganic Chemicals and Reactions"
7. Organic natural products containing carbon-metal or carbon-metalloidal covalent bonds: Appropriate Natural Products Section.
8. Studies of organometallic and organometalloidal compounds as biological models or as metabolites or metabolic intermediates in biological systems, or where there is major emphasis on biological activity: Appropriate Biochemistry Section.
9. Chemical syntheses of organometallic compounds in which an industrial enzymic or fermentation step is the point of the study: Section 16: "Fermentation and Bioindustrial Chemistry" (See C.3)

10. Polymeric organometallic compounds in which the metal center is involved in the polymerization with formation of carbon-metal bonds in the polymer backbone and the interest is in the polymer: Section 35: "Chemistry of Synthetic High Polymers". Other polymeric organometallic compounds, such as poly(organophosphazanes) or polysiloxanes: Appropriate Macromolecular Section.
11. Electrochemical synthesis of organometallic compounds when the interest is in the method, not the reaction product: Section 72: "Electrochemistry" (See C.3)
12. Synthesis of organic compounds containing a carbon-metal or carbon-metalloid bond, e.g., C-Si, C-Se, when the interest is not in the fragment containing that bond: Appropriate Organic Chemistry Section for the moiety of interest.
13. Manufacture and processing of industrial organometallic compounds with emphasis on manufacturing technology (i.e., studies with some evidence of large-scale manufacturing intent, such as studies on process optimization, process scale-up, engineering aspects of the process, product yield improvement, catalyst activity and selectivity, or apparatus): Section 45: "Industrial Organic Chemicals, Leather, Fats, and Waxes". A List of Common Industrial Organic Chemicals is appended to Section 45.
14. Synthesis of additives for lubricants, fuels, and other petroleum- and coal-related products, when the use is demonstrated: Section 51: "Fossil Fuels, Derivatives, and Related Products"

C. Cross-References

1. A.1, A.2 - Studies in which biological activity is also reported: cross-refer to the appropriate Biochemistry Section, e.g.,
 - Section 1: "Pharmacology" for pharmacological activity
 - Section 2: "Mammalian Hormones" for hormone analogs and hormone-like activity
 - Section 4: "Toxicology" for toxic substances, such as mutagens and carcinogens
 - Section 5: "Agrochemical Bioregulators" for compounds with agricultural applications
 - Section 7: "Enzymes" for enzyme analogs
 - Section 10: "Microbial, Algal, and Fungal Biochemistry" for compounds tested on these organisms in vitro
 - Section 63: "Pharmaceuticals" for data on drug formulations and drug physical properties
2. A.3 - Section 22: "Physical Organic Chemistry"
3. B.9, B.11 - Section 29: "Organometallic and Organometalloidal Compounds"

D. Subsection Arrangement

0. Reviews
1. General
2. Group 1 (IA) - Li, Na, K, Rb, Cs, Fr
3. Group 2 (IIA) - Be, Mg, Ca, Sr, Ba, Ra
4. Boron compounds
5. Group 13 (IIIA) - Al, Ga, In, Tl
6. Silicon compounds
7. Phosphorus compounds
8. Groups 14 (IVA), 15 (VA), 16 (VIA) - Ge, Sn, Pb, As, Sb, Bi, Se, Te, Po
9. Groups 11 (IB), 12 (IIB) - Cu, Ag, Au, Zn, Cd, Hg
10. Groups 3 (IIIB), 4 (IVB), 5 (VB) - Sc, Y, lanthanides, actinides, Ti, Zr, Hf, V, Nb, Ta
11. Groups 6 (VIB), 7 (VIIB) - Cr, Mo, W, Mn, Tc, Re
12. Iron compounds
13. Groups 8, 9, 10 (VIII) - Co, Ni, Ru, Rh, Pd, Os, Ir, Pt
14. Metal heterocyclic compounds and cluster compounds

Section 30: Terpenes and Terpenoids

A. Coverage in This Section

1. Synthesis, reactions, characterization, and structure studies of terpenes and terpenoids, compounds possessing carbon skeletons that for the most part can be regarded as built by fusion of two or more isoprene units, including biological activity of newly prepared compounds. (See C.1)
2. Physical organic studies of terpenes and terpenoids where no biological significance is stated. (See B.3, C.2)
3. Steroidal terpenoids. (See C.3)
4. Rosins, tall oil, resin acids, and turpentine, only if specific terpenoid components are emphasized or characterized. (See B.7, C.4)
5. Studies in which electromagnetic radiation, an electrochemical process, or a biological system is used as a tool in synthesis of terpenes and terpenoids and in which the interest is in the product, not in the system used. (See B.5, B.6)

B. Alternative Placement and Exclusion from Coverage in CA

1. Terpenoid alkaloids: Section 31: "Alkaloids"
2. Isolation studies and studies in which both the first isolation of a terpenoid and characterization or structure elucidation are reported: Appropriate Biochemistry Section. (See C.5)
3. Physical organic studies where biological significance is stated: Appropriate Biochemistry Section.
4. Studies of terpenes and terpenoids as biological models, as metabolites or metabolic intermediates in biological systems, or where there is major emphasis on biological activity: Appropriate Biochemistry Section.
5. Chemical syntheses of terpenes and terpenoids in which an industrial enzymic or fermentation step is the point of the study: Section 16: "Fermentation and Bioindustrial Chemistry" (See C.5)
6. Electrochemical synthesis of terpenes and terpenoids when the interest is in the method, not the product: Section 72: "Electrochemistry" (See C.5)
7. Rosins, tall oil, resin acids, and turpentine, except as indicated in A.4:
Section 11: "Plant Biochemistry"
Section 43: "Cellulose, Lignin, Paper, and Other Wood Products"

C. Cross-References

1. A.1 - Studies in which biological activity is also reported: cross-refer to the appropriate Biochemistry Section, e.g.,
Section 1: "Pharmacology" for pharmacological activity
Section 2: "Mammalian Hormones" for hormone analogs and hormone-like activity
Section 4: "Toxicology" for toxic substances, such as mutagens and carcinogens
Section 5: "Agrochemical Bioregulators" for compounds with agricultural applications
Section 7: "Enzymes" for enzyme analogs
Section 10: "Microbial, Algal, and Fungal Biochemistry" for compounds tested on these organisms in vitro
Section 63: "Pharmaceuticals" for data on drug formulations and drug physical properties
2. A.2 - Section 22: "Physical Organic Chemistry"
3. A.3 - Section 32: "Steroids"
4. A.4 - Section 43: "Cellulose, Lignin, Paper, and Other Wood Products"
5. B.2, B.5, and B.6 - Section 30: "Terpenes and Terpenoids"

D. Subsection Arrangement

0. Reviews
1. General
10. Monoterpenes (C₁₀), including cannabinoids, chrysanthemic acids, and iridoid aglycons
15. Sesquiterpenes (C₁₅), including ionones
20. Diterpenes (C₂₀), including gibberellins, retinoids, quassinoids, and tocopherols
25. Sesterterpenes (C₂₅)
30. Triterpenes (C₃₀), including limonoids
40. Higher terpenes and miscellaneous terpenoids, including carotenoids and vitamins K

Section 31: Alkaloids

A. Coverage in This Section

1. Synthesis, reactions, characterization, and structure studies of alkaloids (nitrogenous bases of plant, animal, or microbial origin, with typically characteristic physiological activity), including analogs of known alkaloids and intermediates in the synthesis of known alkaloids and including biological activity of newly synthesized compounds. (See C.1)
2. Physical organic studies of alkaloids where no biological significance is stated. (See B.4, C.2)
3. Terpenoid alkaloids. (See C.3)
4. Peptide alkaloids. (See C.4)
5. Studies in which electromagnetic radiation, an electrochemical process, or a biological system is used as a tool in synthesis of alkaloids and in which the interest is in the product, not in the system used. (See B.6, B.7)

B. Alternative Placement and Exclusion from Coverage in CA

1. Steroidal alkaloids: Section 32: "Steroids" (See C.5)
2. Biological amines (such as phenethylamine and tyramine) and purine derivatives (such as caffeine, theobromine, and theophylline): Section 26: "Biomolecules and Their Synthetic Analogs"
3. Isolation studies and studies in which both the first isolation of an alkaloid and characterization or structure elucidation are reported: Appropriate Biochemistry Section. (See C.5)
4. Physical organic studies where biological significance is stated: Appropriate Biochemistry Section.
5. Studies of alkaloids as biological models, as metabolites or metabolic intermediates in biological systems, or where there is major emphasis on biological activity: Appropriate Biochemistry Section.
6. Chemical syntheses of alkaloids in which an industrial enzymic or fermentation step is the point of the study: Section 16: "Fermentation and Bioindustrial Chemistry" (See C.5)
7. Electrochemical synthesis of alkaloids when the interest is in the method, not in the reaction product: Section 72: "Electrochemistry" (See C.5)

C. Cross-References

1. A.1 - Studies in which biological activity is also reported: cross-refer to the appropriate Biochemistry Section, e.g.,
Section 1: "Pharmacology" for pharmacological activity
Section 2: "Mammalian Hormones" for hormone analogs and hormone-like activity
Section 4: "Toxicology" for toxic substances, such as mutagens and carcinogens
Section 5: "Agrochemical Bioregulators" for compounds with agricultural applications
Section 7: "Enzymes" for enzyme analogs
Section 10: "Microbial, Algal, and Fungal Biochemistry" for compounds tested on these organisms in vitro
Section 63: "Pharmaceuticals" for data on drug formulations and drug physical properties
2. A.2 - : Section 22: "Physical Organic Chemistry"
3. A.3 - Section 30: "Terpenes and Terpenoids"
4. A.4 - Section 34: "Amino Acids, Peptides, and Proteins"
5. B.1, B.3, B.6, and B.7 - Section 31: "Alkaloids"

D. Subsection Arrangement

0. Reviews
1. General
2. Alkaloids containing one nitrogen atom not in a ring
3. Alkaloids containing one nitrogen atom in a ring
4. Alkaloids containing one nitrogen atom at a bridgehead
5. Alkaloids containing two nitrogen atoms
6. Alkaloids containing three or more nitrogen atoms
7. Alkaloids of unknown structure

Section 32: Steroids

A. Coverage in This Section

1. Synthesis, reactions, characterization, and structure studies of steroids, substances containing the cyclopenta[a]phenanthrene structure, which may be of plant, animal, or microbial origin, homo and seco analogs, and closely related compounds and biological activity of newly synthesized compounds. (See C.1)
2. Physical organic studies of steroids where no biological significance is stated. (See B.2, C.2)
3. Steroidal alkaloids. (See C.3)
4. Heteroatom replacement analogs of steroids or fused heterocyclic ring derivatives of steroids. (See B.4)
5. Studies in which electromagnetic radiation, an electrochemical process, or a biological system is used as a tool in synthesis of steroids and in which the interest is in the product, not in the system used. (See B.8, B.9).

B. Alternative Placement and Exclusion from Coverage in CA

1. Isolation studies and studies in which both the first isolation of a steroid and characterization or structure elucidation are reported: Appropriate Biochemistry Section. (See C.4)
2. Physical organic studies where biological significance is stated: Appropriate Biochemistry Section.
3. Studies of steroids as biological models, as metabolites or metabolic intermediates in biological systems, or where there is major emphasis on biological activity: Appropriate Biochemistry Section.
4. Heterocyclic analogs of steroids lacking typical steroid stereochemistry:
Section 27: "Heterocyclic Compounds (One Hetero Atom)"
Section 28: "Heterocyclic Compounds (More Than One Hetero Atom)"
5. Preparation and properties of cholesteric liquid crystals: Section 75: "Crystallography and Liquid Crystals"
6. Steroidal saponins: Section 33: "Carbohydrates" (See C.4)
7. Steroidal terpenoids: Section 30: "Terpenes and Terpenoids" (See C.4)
8. Chemical syntheses of steroids in which an industrial enzymic or fermentation step is the point of the study:
Section 16: "Fermentation and Bioindustrial Chemistry" (See C.4)
9. Electrochemical synthesis of steroids when the interest is in the method, not in the reaction product: Section 72: "Electrochemistry" (See C.4)

C. Cross-References

1. A.1 - Studies in which biological activity is also reported: cross-refer to the appropriate Biochemistry Section, e.g.,
Section 1: "Pharmacology" for pharmacological activity
Section 2: "Mammalian Hormones" for hormone analogs and hormone-like activity
Section 4: "Toxicology" for toxic substances, such as mutagens and carcinogens
Section 5: "Agrochemical Bioregulators" for compounds with agricultural applications
Section 7: "Enzymes" for enzyme analogs
Section 10: "Microbial, Algal, and Fungal Biochemistry" for compounds tested on these organisms in vitro
Section 63: "Pharmaceuticals" for data on drug formulations and drug physical properties
2. A.2 - Section 22: "Physical Organic Chemistry"
3. A.3 - Section 31: "Alkaloids"
4. B.1, B.6, B.7, B.8, B.9 - Section 32: "Steroids"

D. Subsection Arrangement

0. Reviews

1. General
2. Gonanes
3. Estranes
4. Androstanes
5. Pregnanes
6. Cholanes
7. Cholestanes, ergostanes, stigmastanes, vitamin D derivatives
8. Cardiac aglycons, toad poisons, sapogenins, steroidal alkaloids, cardanolides, bufanolides, and others

Section 33: Carbohydrates

A. Coverage in This Section

1. Nonindustrial synthesis, reactions, characterization, and structure studies of three-membered (i.e., glycerol, glyceraldehyde) and higher carbohydrates and their derivatives and polymers, including biological activity of newly synthesized compounds. (See B.8, C.1)
2. Synthesis, reactions, characterization, and structure studies of nucleosides and nucleotides and their derivatives and polymers, including biological activity of newly synthesized compounds. (See B.11-B.13, C.1)
3. Chemical synthesis and semisynthesis, reactions, characterization, and structure studies of nucleic acids and their derivatives and polymers, including biological activity of newly synthesized compounds. (See B.12, C.1)
4. Physical organic studies of carbohydrates, nucleosides, nucleotides, and nucleic acids where no biological significance is stated. (See B.2, C.2)
5. Steroidal saponins. (See C.3)
6. Studies in which electromagnetic radiation, an electrochemical process, or a biological system is used as a tool in synthesis of carbohydrates, nucleosides, and nucleotides and in which the interest is in the product, not in the system used. (See B.4, B.5).

B. Alternative Placement and Exclusion from Coverage in CA

1. Isolation studies and studies in which both the first isolation of a compound and characterization or structure elucidation are reported: Appropriate Biochemistry Section. (See C.4)
2. Physical organic studies where biological significance is stated: Appropriate Biochemistry Section.
3. Studies of carbohydrates as biological models, as metabolites or metabolic intermediates in biological systems, or where there is major emphasis on biological activity: Appropriate Biochemistry Section.
4. Chemical syntheses of carbohydrates in which an industrial enzymic or fermentation step is the point of the study: Section 16: "Fermentation and Bioindustrial Chemistry" (See C.4)
5. Electrochemical synthesis of carbohydrates when the interest is in the method, not in the reaction product: Section 72: "Electrochemistry" (See C.4)
6. Aglycons of glycosides: Appropriate Natural Products Section.
7. Cellulose, lignins, paper, and wood products:
Section 11: "Plant Biochemistry"
Section 43: "Cellulose, Lignin, Paper, and Other Wood Products"
8. Glycopeptides and glycoproteins: Section 34: "Amino Acids, Peptides, and Proteins" or appropriate Biochemistry Section.
9. Carbohydrates of commercial and industrial significance, such as cane and beet sugars, molasses, starches, gums, mucilages, and pectins: Section 44: "Industrial Carbohydrates" or appropriate Biochemistry Section.
10. Cobalamin precursors not containing the nucleotide moiety and their analogs: Section 26: "Biomolecules and Their Synthetic Analogs"
11. Nucleic acid bases: Section 26: "Biomolecules and Their Synthetic Analogs"
12. Studies on nucleic acid composition, including bases, nucleosides, nucleotides, and functional groups and structural elucidation of these constituents: Section 6: "General Biochemistry"
13. Synthesis of nucleic acids by genetic methods when there is novelty in the genetic aspects: Section 3: "Biochemical Genetics"

C. Cross-References

1. A.1 - Studies in which biological activity is also reported: cross-refer to the appropriate Biochemistry Section, e.g.,
 - Section 1: "Pharmacology" for pharmacological activity
 - Section 2: "Mammalian Hormones" for hormone analogs and hormone-like activity
 - Section 4: "Toxicology" for toxic substances, such as mutagens and carcinogens
 - Section 5: "Agrochemical Bioregulators" for compounds with agricultural applications
 - Section 7: "Enzymes" for enzyme analogs
 - Section 10: "Microbial, Algal, and Fungal Biochemistry" for compounds tested on these organisms in vitro
 - Section 63: "Pharmaceuticals" for data on drug formulations and drug physical properties
2. A.4 - Section 22: "Physical Organic Chemistry"
3. A.5 - Section 32: "Steroids"
4. B.1, B.4, and B.5 - Section 33: "Carbohydrates"

D. Subsection Arrangement

0. Reviews
 1. General
 2. Monosaccharides, glycals
 3. Glycosides
 4. Oligosaccharides
 5. Polysaccharides
 6. Alditols, cyclitols, glycerides
 7. Amines
 8. Acids
 9. Nucleosides and nucleotides, cobalamins, riboflavin
 10. Nucleic acid chemical synthesis

Section 34: Amino Acids, Peptides, and Proteins

A. Coverage in This Section

1. Synthesis, reactions, characterization, and structure studies of naturally occurring amino acids, synthetic alpha-amino acids, and their derivatives, including pantothenic acid, folic acid derivatives and including biological activity of newly prepared compounds. (See B.1, C.1)
2. Synthesis, reactions, characterization, and structure studies of peptides, glycopeptides, and their derivatives (less than 50 amino acid residues), including biological activity of newly prepared compounds. (See C.1)
3. Synthesis, reactions, characterization, and structure studies of polymers based exclusively on naturally-occurring amino acids and their derivatives, including biological activity of newly prepared compounds. (See B.2, B.3, C.1)
4. Physical organic studies, such as spectra, conformations, hydrogen bonding, and membrane-forming properties, of naturally-occurring amino acids, peptides, polymers of amino acids and peptides, glycopeptides, and their derivatives where no biological significance is stated. (See B.3, B.6, C.2)
5. Chemical synthesis and semisynthesis of proteins and glycoproteins (50 or more amino acid residues), including biological activity of newly prepared compounds. (See B.8, C.1)
6. Studies in which electromagnetic radiation, an electrochemical process, or a biological system is used as a tool in synthesis of amino acids and peptides and in which the interest is in the product, not in the system used. (See B.11, B.12).

B. Alternative Placement and Exclusion from Coverage in CA

1. Nonnaturally occurring alpha-amino acids with no mention of uses in peptide synthesis: Appropriate Synthetic Organic Section.
2. Synthesis and properties of polymers of nonnaturally-occurring amino acids or their derivatives:
Section 35: "Chemistry of Synthetic High Polymers"
Section 36: "Physical Properties of Synthetic High Polymers"
Section 40: "Textiles and Fibers"
3. Synthesis of polymers based exclusively on naturally-occurring amino acids and their derivatives where the primary emphasis is on their use in polymer technology, e.g., as plastics, fibers, or liquid crystals, and their physical properties of prime interest to polymer technology:
Section 35: "Chemistry of Synthetic High Polymers"
Section 36: "Physical Properties of Synthetic High Polymers"
Section 40: "Textiles and Fibers"
4. Chemistry of collagen and gelatin:
Section 6: "General Biochemistry"
Section 45: "Industrial Organic Chemicals, Leather, Fats, and Waxes"
5. Peptide alkaloids: Section 31: "Alkaloids" (See C.3)
6. Physical organic studies where biological significance is stated: Appropriate Biochemistry Section.
7. Isolation studies and studies in which both the first isolation of a compound and characterization or structure elucidation are reported: Appropriate Biochemistry Section. (See C.3)
8. Other studies of proteins and glycoproteins including amino acid composition and sequence as well as functional groups, cross-links, oligosaccharide moieties, etc.: Section 6: "General Biochemistry"
9. Natural products containing an amino acid or peptide residue where the interest is not in that residue: Natural Products Section appropriate to the fragment of interest.
10. Studies of amino acids and peptides as biological models, as metabolites or metabolic intermediates in biological systems, or where there is major emphasis on biological activity: Appropriate Biochemistry Section.

11. Chemical syntheses of amino acids and peptides in which an industrial enzymic or fermentation step is the point of the study: Section 16: "Fermentation and Bioindustrial Chemistry" (See C.3)
12. Electrochemical synthesis of amino acids or peptides when the interest is in the method, not in the reaction product: Section 72: "Electrochemistry" (See C.3)

C. Cross-References

1. A.1-A.3, A.5 - Studies in which biological activity is also reported: cross-refer to the appropriate Biochemistry Section, e.g.,
 - Section 1: "Pharmacology" for pharmacological activity
 - Section 2: "Mammalian Hormones" for hormone analogs and hormone-like activity
 - Section 4: "Toxicology" for toxic substances, such as mutagens and carcinogens
 - Section 5: "Agrochemical Bioregulators" for compounds with agricultural applications
 - Section 7: "Enzymes" for enzyme analogs
 - Section 10: "Microbial, Algal, and Fungal Biochemistry" for compounds tested on these organisms in vitro
 - Section 63: "Pharmaceuticals" for data on drug formulations and drug physical properties
2. A.4 - Section 22: "Physical Organic Chemistry"
3. B.5, B.7, B.11, B.12 - Section 34: "Amino Acids, Peptides, and Proteins"

D. Subsection Arrangement

0. Reviews
1. General
2. Amino acids
3. Poly(amino acids) and peptides
4. Protein synthesis

Section 35: Chemistry of Synthetic High Polymers

A. Coverage in This Section

1. Preparation and reaction of linear, branched linear, and crosslinked synthetic organic and inorganic polymers (compounds whose structure may be represented by repeating units with degree of polymerization greater than 10). (See B.1, B.3-B.10, B.12)
2. Preparation, processing, and properties of common monomers and of other monomers and reagents specifically prepared for and/or used in the preparation of synthetic polymers. (For List of Common Monomers, see Appendix at end of this section) (See B.3, B.4, B.6, C.1)
3. Preparation and reactions of nonpolymeric compounds when these compounds are used as models for polymers. (See B.3, C.1)
4. Kinetic, thermodynamic, and mechanistic studies of polymerization and polymer reactions. (See B.13, B.15, C.2, C.3)
5. Microbially produced polymers with emphasis on products. (See B.14)
6. Preparation of organometallic coordination polymers such as when an organometallic coordination center is involved in polymerization (e.g., polymerization of a metallocene dihalide with a diacid) or when a nonorganometallic coordination center is involved in polymerization with formation of carbon-metal bonds in the polymer backbone (e.g., polymerization of $(R_3P)_2PtCl_2$ with diacetylenic compounds). (See B.11)

B. Alternative Placement and Exclusion from Coverage in CA

1. Physical and mechanical properties and analysis of synthetic high polymers: Section 36: "Physical Properties of Synthetic High Polymers"
2. Polymer studies bearing heavily on use, processing, or special classes: Appropriate sections as outlined below.
3. Nonpolymeric studies of oligomers (equal to or less than 10 monomer units) and potential monomers (including common monomers): Appropriate organic or inorganic section.
4. Monomers and polymers when of interest for plastics manufacture. Section 37: "Plastics Manufacture and Processing"
5. Fabrication and uses of derivatives, blends, and mixtures of polymers: Section 38: "Plastics Fabrication and Uses"
6. Elastomeric polymers including monomers: Section 39: "Synthetic Elastomers and Natural Rubber"
7. Polymers intended for use as fibers: Section 40: "Textiles and Fibers"
8. Polymers principally for use in coatings: Section 42: "Coatings, Inks, and Related Products"
9. Synthesis of polymers based exclusively on naturally occurring amino acids or their derivatives when there is no emphasis on their use in polymer technology: Section 34: "Amino Acids, Peptides, and Proteins"
10. Polymer-supported catalysts, enzymes, pharmaceuticals, or other reagents in which the polymer is not the novel feature or where emphasis is on application: Appropriate section related to application.
11. Nonorganometallic polynuclear complexes and polymers formed by coordination of a metal center with polydentate ligands (e.g., a polymeric coordination compound formed between $PtCl_4 \cdot 2K$ and a diamine):
Section 49: "Industrial Inorganic Chemicals"
Section 78: "Inorganic Chemicals and Reactions"
12. Polymers prepared as precursors for ceramics with actual conversion to ceramics: Section 57: "Ceramics"
13. Novel electrochemical polymerizations with significant electrochemical interest, e.g., emphasis on the electrochemical cells or electrode reactions: Section 72: "Electrochemistry" (See C.4)

14. Synthesis of polymers in which an industrial enzymic step or a fermentative step is the point of the study:
Section 16: "Fermentation and Bioindustrial Chemistry" (See C.4)
15. Crosslinking with no kinetic, thermodynamic, or mechanistic interest: Section 37: "Plastics Manufacture and Processing"

C. Cross-References

1. A.2 and A.3 - Preparation of model compounds and monomers not on the List of Common Monomers: Cross-refer to appropriate organic or inorganic section.
2. A.4 - Routine electrochemical polymerizations with secondary interest in electrochemical aspects: Section 72: "Electrochemistry"
3. A.4 - Thermodynamic studies of polymerization: Section 69: "Thermodynamics, Thermochemistry, and Thermal Properties"
4. B.13, B.14 - Section 35: "Chemistry of Synthetic High Polymers"

D. Subsections Arrangement

0. Reviews
1. General
2. Monomers and reagents used in polymerization
3. Polymerization kinetics, mechanisms, thermodynamics, catalysis, catalysts
4. Organic addition polymerization
5. Organic condensation and step polymerization
6. Inorganic and coordination polymer synthesis
7. Ring-opening and other polymerizations
8. Chemical transformation of polymers
 - Degradation
 - Grafting
 - Crosslinking reactions
 - Isomerization
 - Reactions of functional groups
 - Intramolecular rearrangements
 - Mechanism of chemical stabilization of polymers
 - Radiation chemistry and photochemistry
 - Complexation with metals
9. Apparatus for polymer synthesis and reactions
10. Other

Appendix - List of Common Monomers

acrylamide	isoprene (Section 39)
acrylic acid and esters	itaconic acid
acrylonitrile	melamine (Section 37)
acryloyl halides	maleic acid and anhydride
adipic acid	methacrylamide
-aminocaproic acid	methacrylic acid and esters
azacyclotridecan-2-one	methacrylonitrile
azelaic acid	methacryloyl halides
benzophenonetetracarboxylic acid dianhydride	methylenedianiline
bisphenol A	-methylstyrene
1,3-butadiene (Section 39)	neopentyl glycol
1-butene	pentaerythritol (Section 37)
caprolactam	phenylenediamines
caprolactone	phthalic anhydride
chloroprene (Section 39)	pimelic acid
1,4-cyclohexanedimethanol	polyethylene glycol
diallyl esters	polypropylene glycol
dicyclopentadiene	propylene
diisocyanates, esp.	propylene oxide
hexamethylene diisocyanate	pyromellitic acid and anhydrides
isophorone diisocyanate	resorcinol
methylenedi- <i>p</i> -phenylene diisocyanate (MDI)	sebacic acid and esters
tolylene diisocyanate	styrene
dimer acids (Section 37)	suberic acid and esters
divinylbenzene (Section 37)	terephthalic acid and esters
dodecanedioic acid	tetrafluoroethylene
epichlorohydrin	triallyl cyanurate (Section 37)
ethylene	trimellitic acid and anhydride (Section 37)
ethylene oxide	trimethylolethane (Section 37)
formaldehyde	trimethylolpropane (Section 37)
fumaric acid	trioxane
hexamethylenediamine	vinyl acetate
hexanediol	vinyl halides
isobutylene	vinylidene halides
isophthalic acid and esters	<i>N</i> -vinylpyrrolidone

While most of the above monomers are placed in Section 35, some are normally placed in Section 37 or in Section 39. These are so indicated. Section 35: "Chemistry of Synthetic High Polymers" Section 37: "Plastics Manufacture and Processing" Section 39: "Synthetic Elastomers and Natural Rubber"

Also note that studies involving these compounds in specific ways unrelated to polymerization or polymers are placed in the appropriate organic sections. (See B.3)

Section 36: Physical Properties of Synthetic High Polymers

A. Coverage in This Section

1. Physical properties of linear, branched linear, and crosslinked synthetic organic and inorganic polymers (compounds whose structure may be represented by repeating units with degree of polymerization greater than 10). (See B.1, B.3-B.7, C.1)
2. Determination and significance of the mechanical, thermal, electrical, magnetic, optical, and solution properties of polymers and copolymers. (See B.8, B.9, B.10, B.11, C.1)
3. Physical properties of nonpolymeric compounds when these compounds are used as models for polymers. (See C.1, C.2)
4. Physical interactions between polymers or between polymers and low- molecular-weight compounds.
5. Analysis of the composition of polymers or copolymers and of the components and chemicals related to polymer studies. (See C.3)
6. Structure of synthetic high polymers, including crystal structure and morphology. (see B.12, C.1)

B. Alternative Placement and Exclusion from Coverage in CA

1. Preparation and reactions of synthetic high polymers: Section 35: "Chemistry of Synthetic High Polymers"
2. Polymer studies bearing heavily on use, processing, or special classes: Appropriate sections as outlined below.
3. Properties of monomers and polymers when of interest for plastics manufacture.
Section 37: "Plastics Manufacture and Processing"
4. Properties of elastomeric polymers: Section 39: "Synthetic Elastomers and Natural Rubber"
5. Properties of polymers intended for use as fibers: Section 40: "Textiles and Fibers"
6. Properties of polymers principally for use in coatings: Section 42: "Coatings, Inks, and Related Products"
7. Physical properties of polymers based exclusively on naturally occurring amino acids and their derivatives when the properties are of prime interest to protein/peptide physical chemistry (e.g., spectra, conformations, hydrogen bonding, membrane-forming properties): Section 34: "Amino Acids, Peptides, and Proteins"
8. Doping to enhance electrical conductivity: Section 76: "Electric Phenomena"
9. Mechanism of electrical conduction in doped or undoped polymers: Section 76: "Electric Phenomena"
10. Thermal degradation reactions of polymers: Section 35: "Chemistry of Synthetic High Polymers"
11. Polymers used for drag reduction in flow or when Tompa effect in polymer-containing solutions is studied: Section 48: "Unit Operations and Processes"
12. Phase structures and transitions of polymeric liquid crystals: Section 75: "Crystallography and Liquid Crystals"

C. Cross-References

1. A.1, A.2, A.3, A.6 - Cross-refer to appropriate property-related section.
2. A.3 - Cross-refer to appropriate organic or inorganic section.
3. A.5 - Analysis with emphasis on methodology:
Section 79: "Inorganic Analytical Chemistry"
Section 80: "Organic Analytical Chemistry"

D. Subsection Arrangement

0. Reviews
1. General
2. Polymer structure
 - Structure determination
 - Polymer chain flexibility
 - Configuration and conformation
 - Crystal structure
 - Morphology
3. Polymer physical states
 - Phase transitions
 - Crystallinity
 - Glassy state
 - Viscofluid state
4. Analysis, molecular weight determination, and fractionation
5. Physical properties of polymers
 - Surface phenomena
 - Mechanical phenomena
 - Electric and magnetic phenomena
 - Rheological properties
 - Thermal properties
 - Electronic structure
6. Physical interactions of polymers
 - Mechanism of plasticization
 - Polymer compatibility
 - Modification of polymer properties by physical means
7. Polymer solutions and gels
 - Equilibrium
 - Solution properties
 - Kinetics
 - Thermodynamics
 - Swelling
 - Mechanical properties
8. Permeability of polymers
 - Gas and liquid permeability
 - Vapor sorption by polymers
9. Apparatus for measuring properties of polymers
10. Other

Section 37: Plastics Manufacture and Processing

A. Coverage in This Section

1. Preparation, manufacture, testing, and processing of synthetic resins for use in plastics manufacture. (See B.1-B.4, B.6, B.7, B.11)
2. Analysis of the composition of resins and the components and chemicals related to plastics manufacture. (See C.1)
3. Natural resins for use in plastics manufacture. (See B.9, B.10)
4. Mechanical, optical, electrical, rheological, and thermal properties of resins for plastics manufacture. (See B.5, C.2)
5. Processing of monomers and additives for use in resin and plastics manufacture. (For a List of Common Monomers, see Appendix in Section 35: "Chemistry of Synthetic High Polymers") (See C.3)
6. Curing, crosslinking, and agents for these processes. (See B.15)
7. Plasticizing and plasticizers.
8. Fillers and reinforcing.
9. Foaming and foaming agents, stabilizing and stabilizers, and dispersions.
10. Plastics coloring and dyeing. (See B.8)
11. Processing of resins for leather substitutes.
12. Preparation of ion-exchange resins. (See B.12)
13. Processing of synthetic adhesive components (epoxy resins, polyurethanes).
14. Potting compositions when emphasis is on composition. (See B.13)
15. Radiosensitive, including photosensitive, compositions when specific use is not demonstrated. (See B.14)

B. Alternative Placement and Exclusion from Coverage in CA

1. Manufacture and processing of coatings: Section 42: "Coatings, Inks, and Related Products"
2. Apparatus and fabrication processes for forming finished plastic products (molding, extrusion): Section 38: "Plastics Fabrication and Uses"
3. Welding of plastics: Section 38: "Plastics Fabrication and Uses"
4. Preparation and reactions of synthetic high polymers when not of interest for plastics manufacture: Section 35: "Chemistry of Synthetic High Polymers"
5. Physical and mechanical properties of synthetic high polymers when not of interest for plastics manufacture: Section 36: "Physical Properties of Synthetic High Polymers"
6. Resins intended for use as fibers: Section 40: "Textiles and Fibers"
7. Elastomeric resins: Section 39: "Synthetic Elastomers and Natural Rubber"
8. Synthesis of dyes and organic pigments: Section 41: "Dyes, Organic Pigments, Fluorescent Brighteners, and Photographic Sensitizers"
9. Natural resins for use in coating materials: Section 42: "Coatings, Inks, and Related Products"
10. Natural resins as naval stores: Section 43: "Cellulose, Lignin, Paper, and Other Wood Products"
11. Reclamation, recycling, and reprocessing of resins and plastics: Section 38: "Plastics Fabrication and Uses"
12. Fabrication and use of ion-exchange resins: Section 38: "Plastics Fabrication and Uses"
Ion-exchange theory and experiment without specific application: Section 66: "Surface Chemistry and Colloids"
13. Use and performance of potting compositions: Section 38: "Plastics Fabrication and Uses"

14. Specific demonstrated use of radiosensitive compositions (e.g., photoresists): Appropriate section related to application (e.g., Section 74: "Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes")
15. Crosslinking with kinetic, thermodynamic, or mechanistic interest: Section 35: "Chemistry of Synthetic High Polymers"

C. Cross-References

1. A.2 - Analysis with emphasis on methodology:
Section 79: "Inorganic Analytical Chemistry"
Section 80: "Organic Analytical Chemistry"
2. A.4 - Property studies with substantial physical chemistry interest: Cross-refer to appropriate physical chemistry section.
3. A.5 - Preparation of additives and monomers not on the List of Common Monomers: Cross-refer to appropriate synthetic organic or inorganic section.

D. Subsection Arrangement

0. Reviews
1. General
2. Processing of monomers and additives
3. Preparation of resins
4. Chemical properties of resins
5. Physical properties and testing methods
 - General
 - Analysis
 - Mechanical
 - Optical
 - Electrical
 - Rheological
 - Thermal
6. Formulating procedures and compositions
 - Curing (crosslinking) and curing agents
 - Plasticizing and plasticizers
 - Reinforcing and fillers
 - Extension and extenders
 - Foaming and blowing agents
 - Stabilizing and stabilizers
 - Coloring and pigments or dyes
 - Dispersions

Section 38: Plastics Fabrication and Uses

A. Coverage in This Section

1. End-product fabrication from and uses of resins. (See B.1, B.3, B.7, B.8, B.12, B.14, B.16-B.22, C.1)
2. Fabricating processes of chemical or chemical engineering interest.
3. Fabricating techniques (molding, extruding, coating, laminating, and impregnating), when of chemical or chemical engineering interest (e.g., engineering processes involved during fabrication such as heat transfer and variation of melt viscosity with shear rate).
4. Fabrication and uses of membranes, including hollow-fiber membranes. (See B.11, B.15)
5. Fabrication and uses of leather substitutes.
6. Fabrication and uses of ion-exchange resins. (See B.11)
7. Fabrication and uses of adhesives from synthetic materials.
8. Fabrication and uses of foamed polymeric materials. (See C.1)
9. Fabrication and uses of plastic laminates, including polymer-metal laminates. (See C.1)
10. Welding of plastics.
11. Coating metals onto plastics. (See B.4, B.5, B.6)
12. Reclamation, recycling, and reprocessing of resins and plastics.
13. Analysis and properties of fabricated plastics. (See B.2, B.10, C.2)
14. Polymer concrete, when containing only polymeric binders. (See B.9, C.3)
15. Potting compositions when emphasis is on performance and nonspecific uses. (See B.13)
16. Polymer-based roofing materials. (See B.23, C.3)
17. Paper substitutes not prepared from fibers. (See B.24, B.25)
18. Wire and cable jacketing. (See B.26, C.4)
19. Fabrication of polymeric fibers for optical fibers. (See B.27)

B. Alternative Placement and Exclusion from Coverage in CA

1. Fabrication and uses of elastomers, including natural rubber: Section 39: "Synthetic Elastomers and Natural Rubber"
2. Interaction between food and food packaging materials: Section 17: "Food and Feed Chemistry"
3. Fabrication and use of plastics in prosthetic devices (including contact lenses), dental materials, and surgical goods: Section 63: "Pharmaceuticals"
4. Metallic coating on plastics applied by unique or new methods of electrodeposition: Section 72: "Electrochemistry"
5. Metallic coating on plastics applied by new methods other than electrodeposition:
Section 55: "Ferrous Metals and Alloys"
Section 56: "Nonferrous Metals and Alloys"
6. Coating plastics onto metals: Section 42: "Coatings, Inks, and Related Products"
7. Fabrication and uses of fibers: Section 40: "Textiles and Fibers"
8. Fabrication and uses of plastics as waxes: Section 45: "Industrial Organic Chemicals, Leather, Fats, and Waxes"
9. Polymer concrete containing cement binders: Section 58: "Cement, Concrete, and Related Building Materials"
10. Doping and other modifications of plastics to produce electrically conductive devices: Section 76: "Electric Phenomena"
11. Specific uses for polymer membranes and ion-exchange resins: Appropriate section related to application.

12. Polymer supports for chromatographic columns, catalysts, enzymes, pharmaceuticals, and other reagents in which the polymer is not the novel feature or where emphasis is on application: Appropriate section related to application.
13. Potting compositions when emphasis is on composition rather than use or performance of the materials: Section 37: "Plastics Manufacture and Processing"
When emphasis is on specific applications: Appropriate section related to application.
14. Floor coverings (polymer-based) other than carpets: Section 42: "Coatings, Inks, and Related Products"
15. Fiber preparation for hollow-fiber membranes: Section 40: "Textiles and Fibers"
16. Carbon-carbon composites: Section 57: "Ceramics" or appropriate section related to use.
17. Polymeric flocculating agents: Section 46: "Surface-Active Agents and Detergents"
18. Polymeric lubricants: Section 51: "Fossil Fuels, Derivatives, and Related Products"
19. Polymeric coatings for magnetic tapes:
Section 42: "Coatings, Inks, and Related Products"
Section 77: "Magnetic Phenomena"
20. Electric and electronic components when the emphasis is on the electric properties rather than on the material for or fabrication of the components: Section 76: "Electric Phenomena"
21. Optical components when the emphasis is on the optical properties rather than on the material for or fabrication of the components: Section 73: "Optical, Electron, and Mass Spectroscopy and Other Related Properties"
22. Photoresists: Section 74: "Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes"
23. Roofing materials with a polymer as a minor component: Section 58: "Cement, Concrete, and Related Building Materials"
24. Paper substitutes as copying paper and image receptors for reprography: Section 74: "Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes"
25. Paper substitutes derived partially or completely from synthetic fibers: Section 43: "Cellulose, Lignin, Paper, and Other Wood Products"
26. Electrically insulating coatings: Section 42: "Coatings, Inks, and Related Products"
27. Glass optical fibers with a polymeric coating:
Section 42: "Coatings, Inks, and Related Products"
Section 57: "Ceramics"
Section 73: "Optical, Electron, and Mass Spectroscopy and Other Related Properties"
28. Excluded from coverage in CA:
 - a. Decorative machining and mechanical finishing
 - b. Design and construction of apparatus for plastics fabrication in the absence of material data or chemical engineering data.

C. Cross-References

1. A.1, A.8, and A.9 - If used as building materials, cross-refer to Section 58: "Cement, Concrete, and Related Building Materials"
2. A.13 - Analysis with emphasis on methodology:
Section 79: "Inorganic Analytical Chemistry"
Section 80: "Organic Analytical Chemistry"
3. A.14 and A.16 - Section 58: "Cement, Concrete, and Related Building Materials"
4. A.18 - Section 76: "Electric Phenomena"

D. Subsection Arrangement

0. Reviews

1. General
2. Fabricating techniques
 - Molding
 - Extrusion
 - Laminating
 - Impregnating
3. Plastic products
 - Unsupported films
 - Adhesives and laminates
 - Mechanical goods
 - Foams
 - Insulators
 - Optical components
 - Ion-exchangers
 - Leather substitutes
 - Potting compositions

Section 39: Synthetic Elastomers and Natural Rubber

A. Coverage in This Section

1. Preparation, determination of chemical, physical, and mechanical properties, crystallization, processing, compounding, vulcanization, and uses of organic and inorganic elastomers. (See B.1, B.2, C.1)
2. Analysis of the composition of synthetic elastomers and natural rubber and of the components and chemicals related to rubber manufacture. (See C.2)
3. Rubber chemicals and starting materials (including monomers) specifically processed for and used in the production of elastomers. (For a List of Common Monomers, see Appendix in Section 35: "Chemistry of Synthetic High Polymers") (See C.3)
4. Preparation of catalysts for polymerization of monomers to elastomers.
5. Chemical engineering related to polymerization processes for the production of synthetic elastomers.
6. Chemical engineering related to the production of such rubber chemicals as vulcanization accelerators and antioxidants.
7. Chemical engineering related to preparation and fabrication of tires and their components.

B. Alternative Placement and Exclusion from Coverage in CA

1. Biochemistry of the genus Hevea: Section 11: "Plant Biochemistry"
2. Manufacture and processing of rubber-containing coatings: Section 42: "Coatings, Inks, and Related Products"
3. Excluded from coverage in CA:
 - a. Physics of elasticity
 - b. Design and construction of apparatus for rubber fabrication in the absence of material data or chemical engineering data.

C. Cross-References

1. A.1 - Property studies with substantial physical chemistry interest: Cross-refer to appropriate physical chemistry section.
2. A.2 - Analysis with emphasis on methodology:
Section 79: "Inorganic Analytical Chemistry"
Section 80: "Organic Analytical Chemistry"
3. A.3 - Preparation of rubber chemicals and starting materials other than monomers on List of Common Monomers: Cross-refer to appropriate synthesis section.

D. Subsection Arrangement

0. Reviews
1. General
2. Preparation of monomers and other rubber chemicals
3. Natural latexes
 - Coagulation, gelling agents
 - Purification

4. Elastomer synthesis
 - Polyisoprene
 - Polybutadiene or other dienes
 - Butadiene copolymers (styrene, acrylonitrile, etc.)
 - Ethylene-propylene copolymers
 - Polyurethanes
 - Polysiloxanes
 - Sulfur-containing polymers
 - Grafting
5. Kinetics of polymerization processes
6. Catalysts and catalysis
7. Chemical properties of elastomers
8. Inorganic elastomers
9. Compounding and processing
 - Fillers
 - Irradiation
 - Reinforcements
 - Foaming
 - Oil extension and plasticization
 - Regeneration, reclaiming
 - Miscellaneous additives
10. Vulcanization, curing, and crosslinking
11. Analysis
12. Physical properties and testing
 - Dynamic and viscoelastic properties
 - Compressibility
 - Crystallization, melting, and other phase transitions
 - Stereospecificity
 - Solution and diffusion behavior
 - Thermal properties
 - Structure
13. Tires and tire components
14. Friction, wear, and aging
15. Other uses and products

Section 40: Textiles and Fibers

A. Coverage in This Section

1. Chemistry and physical properties of natural (e.g., cotton, wool, silk, flax, jute, ramie) and synthetic (e.g., cellulose derivatives, polyamides, polyesters, polyvinyls, spandex) fibers. (See C.1)
2. Analysis of the composition of natural and synthetic fibers and of the components and chemicals related to textile manufacture and processing. (See C.2)
3. Spinning baths, preparation, and coating of fibers. (See B.4-B.7, B.10, B.11)
4. Dyeing, printing, and other coloring procedures. (See B.1, B.2)
5. Chemical treatment (e.g., bleaching, carbonizing, desizing, dry cleaning (not finished garments), laundering, and scouring) of fabrics and fibers, including materials for such treatment. (See B.3, C.3)
6. Chemical finishing (e.g., wash-and-wear and durable press, fulling, setting, and fire-, water-, moth-, fungus-, and shrinkproofing) of fabrics, including finishing materials. (See C.3)
7. Nonwoven textiles.
8. Carbon fibers when the emphasis is on fiber preparation or textile use. (See B.4, B.5, B.8)
9. Forming, coating, sizing, and textile (woven and nonwoven) use of glass fibers. (See B.4, B.5, B.6, B.9)
10. Reinforcing fibers that cannot be placed more specifically. (See B.4, B.5)

B. Alternative Placement and Exclusion from Coverage in CA

1. Dye synthesis: Section 41: "Dyes, Organic Pigments, Fluorescent Brighteners, and Photographic Sensitizers"
2. Relation of dye structure to color: Section 41: "Dyes, Organic Pigments, Fluorescent Brighteners, and Photographic Sensitizers"
3. Dry cleaning and laundering (including the use of fabric softeners) of finished garments: Section 46: "Surface-Active Agents and Detergents"
4. Processing of fibers for tire cords: Section 39: "Synthetic Elastomers and Natural Rubber"
5. Processing of fibers for use as reinforcing agents or other specific application when one particular section is implied (e.g., sutures): Appropriate section related to material being reinforced or to the specific application (e.g., Section 63: "Pharmaceuticals")
6. Preparation of polymeric or glass fibers for use in fiber optics:
Section 38: "Plastics Fabrication and Uses"
Section 57: "Ceramics"
7. Preparation and processing of inorganic fibers, other than carbon and glass fibers, with no textile interest:
Appropriate material or use section.
8. Carbon fibers when emphasis is on refractory uses or ceramics: Section 57: "Ceramics"
9. Glass fibers when emphasis is on composition: Section 57: "Ceramics"
10. Protein fibers and fiber spinning for meat substitutes: Section 17: "Food and Feed Chemistry"
11. Fabrication of hollow-fiber membranes with no fiber preparation: Section 38: "Plastics Fabrication and Uses"
12. Excluded from coverage in CA:
 - a. Fabric manufacture and evaluation.
 - b. Apparatus for nonchemical treatment of fibers and fabrics.
 - c. Technological properties of fabrics.
 - d. Techniques of engineering interest for spinning fibers into yarn.

C. Cross-References

1. A.1 - Property studies with substantial physical chemistry interest: Cross-refer to appropriate physical chemistry section.
2. A.2 - Analysis with emphasis on methodology:
Section 79: "Inorganic Analytical Chemistry"
Section 80: "Organic Analytical Chemistry"
3. A.5, A.6 - Synthesis of processing materials: Cross-refer to appropriate synthesis section.

D. Subsection Arrangement

0. Reviews
1. General
2. Preparation of fibers
3. Analysis, structure, and chemical properties
4. Physical and mechanical properties
5. Coatings
6. Dyeing, printing, fluorescent brightening, and other coloring processes, including materials for such processes.
7. Fiber and yarn processing and processing materials
 - Bleaching
 - Lubricating
 - Texturizing
 - Drawing
 - Mercerization
 - Heat setting (twist)
 - Sizing
8. Textile purification processes and processing materials
 - Bleaching
 - Drycleaning of textiles, but not finished garments
 - Scouring, washing, boiling, or kiering of textiles, but not finished garments
9. Textile finishing processes and processing materials
 - Mercerization
 - Setting
 - Fulling
 - Shrinkproofing
 - Crease resistance, wash-and-wear, durable press
 - Proofing (moth, heat, fire, water, mildew, oil, soil)
10. Nonwoven textiles and other uses

Section 41: Dyes, Organic Pigments, Fluorescent Brighteners, and Photographic Sensitizers

A. Coverage in This Section

1. Synthesis and chemical and physical properties of natural and synthetic dyes and organic pigments. (See C.1, C.2)
2. Analysis of natural and synthetic dyes and organic pigments, when not associated with any particular substrate or use. (See B.5, B.6, B.8, C.3)
3. Synthesis of fluorescent brighteners.
4. Synthesis of photographic color couplers for color pictures, photographic dyes, sensitizers for photographic emulsions, color formers for copying processes, laser dyes, and dyes for optical and electrophotographic devices. (See B.4, C.4, C.5)
5. Synthesis of dye intermediates. (See C.6)

B. Alternative Placement and Exclusion from Coverage in CA

1. Dyeing processes for textiles, with no dye synthesis: Section 40: "Textiles and Fibers"
2. Dyeing processes for leather, with no dye synthesis: Section 45: "Industrial Organic Chemicals, Leather, Fats, and Waxes"
3. Dyeing processes for plastics, with no dye synthesis: Section 37: "Plastics Manufacture and Processing"
4. Photographic emulsion preparation: Section 74: "Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes"
5. Analysis of FD&C dyes: Section 17: "Food and Feed Chemistry"
6. Analysis of cosmetic dyes: Section 62: "Essential Oils and Cosmetics"
7. Hair dyeing compositions or processes: Section 62: "Essential Oils and Cosmetics"
8. Analysis of pharmaceutical dyes: Section 64: "Pharmaceutical Analysis"

C. Cross-References

1. A.1 - Synthesis with application: Cross-refer to appropriate use section.
2. A.1 - Property studies with substantial physical chemistry interest: cross-refer to appropriate physical chemistry section.
3. A.2 - Analysis with emphasis on novel methodology: Section 80: "Organic Analytical Chemistry"
4. A.4 - Photographic materials: Section 74: "Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes"
5. A.4 - Laser dyes: Section 73: "Optical, Electron, and Mass Spectroscopy and Other Related Properties"
6. A.5 - Cross-refer to appropriate organic section.

D. Subsection Arrangement

0. Reviews
1. General
2. Structure correlation with physical properties
3. Azo dyes and pigments
 - Monoazo
 - Polyazo
 - Azomethine

4. Anthraquinones (including other polycyclic quinones) and indigoids
5. Heterocyclics
 - Acridine
 - Thiazine
 - Azine
 - Thiazole
 - Oxazine
 - Xanthene
 - Quinoline
6. Methines and polymethines
7. Phthalocyanines
8. Other dyes and pigments
 - Di- and triarylmethanes
 - Lactones
 - Stilbenes
 - Oxidation bases
 - Sulfur
 - Nitroso and nitro
9. Dye Intermediates
10. Fluorescent brighteners
 - Diaminostilbenes
 - Others
11. Photographic dyes, dye intermediates, and sensitizers
 - Cyanines
 - Carbocyanines
 - Dicarboyanines
 - Higher carbocyanines
 - Merocyanines
 - Oxonols
 - Color couplers
 - Miscellaneous

Section 42: Coatings, Inks, and Related Products

A. Coverage in This Section

1. Chemistry, chemical and physical properties, and analysis of decorative, finishing, and protective coatings. (See B.6, C.1)
2. Analysis of the components and chemicals related to the manufacture and use of coating materials. (See C.2)
3. Paints, lacquers, varnishes, and related products (See B.3-B.5, B.7-B.10, B.16, B.19-B.21, C.3)
4. Coating processes. (See B.1, B.2, B.4, B.11, B.14)
5. Inks, including inks for impact and ink-jet printing. (See B.15)
6. Transfers (e.g., iron-on transfers and bumper stickers).
7. Vehicles, drying oils, pigments, and other components of coatings and inks. (See B.12, B.13)
8. Polishes.
9. Coating plastics onto metals. (See B.1, B.2, C.4)
10. Wire and cable coatings. (See B.6, B.18, C.5)
11. Protective coatings for magnetic tapes. (See B.17)
12. Polymeric electrically conducting coatings when protective function is emphasized. (See B.22, C.6)

B. Alternative Placement and Exclusion from Coverage in CA

1. Metallic coating on plastics applied by unique or new methods of electrodeposition: Section 72: "Electrochemistry"
Other metallic coatings on plastics: Section 38: "Plastics Fabrication and Uses"
2. Metallic coating containing no polymeric binder applied by new methods other than electrodeposition:
Section 55: "Ferrous Metals and Alloys"
Section 56: "Nonferrous Metals and Alloys"
3. Paper coatings applied during paper manufacture and transfer coatings on paper or fibrous paper substitutes:
Section 43: "Cellulose, Lignin, Paper, and Other Wood Products"
4. Coatings and coating processes for photography and other reprographic processes: Section 74: "Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes"
5. Oxide coatings on electrodes:
Section 72: "Electrochemistry"
Section 76: "Electric Phenomena"
6. Electric properties of insulating coatings: Section 76: "Electric Phenomena"
7. Vitreous coatings (glasses, enamels or glazes): Section 57: "Ceramics"
8. Ceramic coatings containing no polymeric binder: Section 57: "Ceramics"
9. Cosmetic enamels: Section 62: "Essential Oils and Cosmetics"
10. Dental enamels: Section 63: "Pharmaceuticals"
11. Printing on textiles: Section 40: "Textiles and Fibers"
12. Synthesis of organic pigments: Section 41: "Dyes, Organic Pigments, Fluorescent Brighteners, and Photographic Sensitizers"
13. Synthesis of inorganic pigments: Appropriate synthetic inorganic section.
14. Reprographic processes in printing platemaking: Section 74: "Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes"
15. Inks (toners) for reprographic processes other than impact or ink-jet printing: Section 74: "Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes"

16. Conversion coatings for metals:
 - Section 55: "Ferrous Metals and Alloys"
 - Section 56: "Nonferrous Metals and Alloys"
17. Functional magnetic coatings for magnetic tapes: Section 77: "Magnetic Phenomena"
18. Wire and cable jacketing: Section 38: "Plastics Fabrication and Uses"
19. Potting compositions:
 - Section 37: "Plastics Manufacture and Processing"
 - Section 38: "Plastics Fabrication and Uses"or section appropriate to specific application.
20. Sizes:
 - Section 40: "Textiles and Fibers"
 - Section 43: "Cellulose, Lignin, Paper, and Other Wood Products"
21. Microbicidal coatings and related products when the emphasis is on the biocidal activity: Section 5: "Agrochemical Bioregulators"
22. Electrically conducting coatings when use as an electric conductor is emphasized: Section 76: "Electric Phenomena" or other appropriate use section.
23. Excluded from coverage in CA:
 - Printing machines

C. Cross-References

1. A.1 - Property studies with substantial physical chemistry interest: Cross-refer to appropriate physical chemistry section.
2. A.2 - Analysis with emphasis on methodology:
 - Section 79: "Inorganic Analytical Chemistry"
 - Section 80: "Organic Analytical Chemistry"
3. A.3 - If related products are putty, caulking, sealants, mastics, etc., Section 58: "Cement, Concrete, and Related Building Materials"
4. A.9 -
 - Section 55: "Ferrous Metals and Alloys"
 - Section 56: "Nonferrous Metals and Alloys"
5. A.10 - Electrically insulating coatings for wires and cables: Section 76: "Electric Phenomena"
6. A.12 - Section 76: "Electric Phenomena"

D. Subsection Arrangement

0. Reviews
 1. General
 2. Coating processes
 3. Curing processes and agents
 4. Coating properties and test methods
 5. Drying oils, solvents, plasticizers, and other additives
 6. Pigments
 7. Acrylic and water-sol (electrophoretic) resin coatings
 8. Polyester and alkyd resin coatings
 9. Epoxy resin coatings
10. Other coating materials
11. Related products

- Putty
 - Caulking and sealing compositions
 - Floor coverings and plastic tiles
 - Decalcomania and transfer products
 - Wax-like polishing materials
 - Coating removers
12. Inks
- Impact-printing inks
 - Ink-jet printing inks
 - Screen-printing inks
 - Stenciling inks
 - Mimeographic inks
 - Writing inks
 - Inks with nonspecified purpose
13. Other uses

Section 43: Cellulose, Lignin, Paper, and Other Wood Products

A. Coverage in This Section

1. Chemical constitution of wood and other paper-making raw materials.
2. Structure and chemical and physical properties of cellulose, lignin, and hemicelluloses. (See C.1)
3. Analysis of cellulose, lignin, hemicellulose, paper, wood, and wood products and of chemicals related to their manufacture and processing. (See C.2)
4. Chemistry and chemical engineering treatment of wood and cellulose for pulp and paper manufacture.
5. Chemistry of pulps, paper products, and spent liquors and their uses.
6. Paper coating and other paper treatment and converting operations.
7. Production and properties of viscose for unspecified use. (See B.1)
8. Preparation of cellulose derivatives. (See B.2)
9. Paper made from fibers or fibrils other than cellulose. (See B.5, B.6)
10. Composite wood products. (See B.8)
11. Naval stores (e.g., rosin, tall oil, turpentine). (See B.7)
12. Waste-paper technology and recycling. (See C.3)

B. Alternative Placement and Exclusion from Coverage in CA

1. Manufacture and properties of fibrous cellulose and its derivatives for use in textiles: Section 40: "Textiles and Fibers"
Production and properties of viscose for use as plastic film (cellophane): Section 37: "Plastics Manufacture and Processing"
2. Processing and use of cellulose derivatives: Appropriate use section.
3. Biochemical studies on trees, with no commercial application: Section 11: "Plant Biochemistry"
4. Microbiology of pulp and paper: Section 10: "Microbial, Algal, and Fungal Biochemistry"
5. Fabrication of plastic films as paper substitutes: Section 38: "Plastics Fabrication and Uses"
6. Pressure-sensitive (carbonless) copying paper and paper used as image receptors for reprography: Section 74: "Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes"
7. Naval stores, if specific terpenoid components are emphasized or characterized: Section 30: "Terpenes and Terpenoids"
8. Wood preservatives when the emphasis is on the biocidal activity: Section 5: "Agrochemical Bioregulators"
9. Excluded from coverage in CA:
Printing machines

C. Cross-References

1. A.2 - For property studies with substantial physical chemistry interest: Cross-refer to the appropriate physical chemistry section.
2. A.3 - Analysis with emphasis on methodology:
Section 79: "Inorganic Analytical Chemistry"
Section 80: "Organic Analytical Chemistry"
3. A.12 - Section 60: "Waste Treatment and Disposal"

D. Subsection Arrangement

0. Reviews
1. General
2. Wood and other cellulosic materials
3. Cellulose
 - Analysis
 - Reactions
 - Extraction
 - Derivatives
 - Properties
 - Uses
4. Hemicelluloses
5. Lignin
6. Pulp and liquors
7. Paper
8. Paper mill effluents
9. Other wood products
 - Wood charcoal
 - Rosin
 - Construction boards
 - Tall oil
 - Furan derivatives
10. Engineering and apparatus

Section 44: Industrial Carbohydrates

A. Coverage in This Section

1. Isolation, treatment, analysis, physical and chemical properties, and uses of commercial noncellulosic carbohydrates including cane and beet sugars, molasses, starches, gums, mucilages, pectins, chitin, and chitosan. (See B.1, B.5, B.6, B.7, C.1)
2. Adhesives from carbohydrates (e.g., starch adhesives).
3. Apparatus for the processing of carbohydrates.

B. Alternative Placement and Exclusion from Coverage in CA

1. Sugars, molasses, honey, and starches as foods: Section 17: "Food and Feed Chemistry"
2. Enzymic processes for industrial carbohydrate food production: Section 17: "Food and Feed Chemistry"
3. Noncommercial studies of noncellulosic carbohydrates: Section 33: "Carbohydrates"
4. Fermentation processes for industrial carbohydrate production and recovery: Section 16: "Fermentation and Bioindustrial Chemistry"
5. Commercial cellulosic carbohydrates: Section 43: "Cellulose, Lignin, Paper, and Other Wood Products"
6. Use of industrial carbohydrates as plastics:
Section 37: "Plastics Manufacture and Processing"
Section 38: "Plastics Fabrication and Uses"
7. Use of industrial carbohydrates in pharmaceuticals: Section 63: "Pharmaceuticals"
8. Excluded from coverage in CA:
Sugar-plant biology, agriculture, and milling.

C. Cross-References

1. A.1 - Analysis with emphasis on methodology: Section 80: "Organic Analytical Chemistry"

D. Subsection Arrangement

0. Reviews
1. General
2. Sugar juices
 - Sugarcane
 - Sugarbeet
 - Others
3. Sugar syrups
 - Glucose syrup
 - Fructose syrup
 - Molasses
 - Masecutes
 - Liquid sugars
4. Sucrose and other sugars
5. Nonsugars
 - Chitin
 - Chitosan
 - Others

6. Starches and their derivatives
 - Amylose
 - Amylopectin
 - Dextrin
 - Glycogen
 - Others
7. Mucilages, gums, and pectins
8. Adhesives
9. Apparatus and engineering

Section 45: Industrial Organic Chemicals, Leather, Fats, and Waxes

A. Coverage in This Section

1. Manufacture of industrial organic and organometallic chemicals with emphasis on manufacturing technology (i.e., studies with evidence of large-scale manufacturing intent such as studies on process optimization, process scale-up, engineering aspects of the process, product yield improvement, catalyst activity and selectivity, or apparatus). (For List of Common Industrial Organic Chemicals, see Appendix at end of this section.) (See B.1-B.5, B.10, B.14, B.15)
2. Manufacture of industrial organic chemicals for use as chemical feedstocks. (See B.14)
3. Properties and application of industrial organic chemicals which are not within the scope of other sections. (See B.17)
4. Catalysts for manufacture of industrial organic chemicals. (See B.13, B.16)
5. Manufacture and properties of tanning materials.
6. Tanning of furs, skins, and hides.
7. Dyeing and finishing of tanned furs, skins, and hides.
8. Chemistry of collagen, gelatin, and animal glues. (See B.6)
9. Recovery and use of effluents and offal from hide and leather processing.
10. Analysis of leather, leather products and related materials, and of chemicals related to their processing and manufacture. (See C.1)
11. Extraction, separation, chemical and physical properties, and treatment of inedible or unspecified animal and vegetable fats and glyceridic oils. (See B.8, C.1, C.2)
12. Chemistry (including synthesis) of synthetic glycerides and natural and synthetic waxes (e.g., esters of high-molecular-weight fatty acids and alcohols and poly(ethylene oxide) waxes). (See B.9)
13. Analysis of inedible or unspecified animal and vegetable fats and glyceridic oils, synthetic glycerides, and waxes and of the components and chemicals related to their isolation and manufacture. (See C.1)
14. Chemistry of fatty acids as products of fats and oils, including fatty acid synthesis by saponification of glyceridic fats and oils. Section 3: "Biochemical Genetics" (See B.12)
15. Industrial synthesis of fatty acids from starting materials other than fats and oils. Section 4: "Toxicology" (See B.11, B.12, B.14)

B. Alternative Placement and Exclusion from Coverage in CA

1. Nonindustrial synthesis of organic compounds: Appropriate synthetic organic section.
2. Carbohydrates of commercial and industrial significance, such as cane and beet sugars, molasses, starches, gums, mucilages, and pectins: Section 44: "Industrial Carbohydrates"
3. Cellulose, lignins, paper, and wood products: Section 43: "Cellulose, Lignin, Paper, and Other Wood Products"
4. Chemistry (including synthesis and manufacture) of polymers and related monomers: Appropriate macromolecular section.
5. Synthesis of dyes: Section 41: "Dyes, Organic Pigments, Fluorescent Brighteners, and Photographic Sensitizers"
6. Biochemistry of collagen and gelatin: Section 6: "General Biochemistry"
7. Leather substitutes:
 - Section 37: "Plastics Manufacture and Processing"
 - Section 38: "Plastics Fabrication and Uses"
 - Section 39: "Synthetic Elastomers and Natural Rubber"
8. Edible fats and oils: Section 17: "Food and Feed Chemistry"

9. Petroleum-derived waxes: Section 51: "Fossil Fuels, Derivatives, and Related Products"
Waxes in polishes: Section 42: "Coatings, Inks, and Related Products"
10. Surface-active agents and detergents: Section 46: "Surface-Active Agents and Detergents"
11. Nonindustrial synthesis of fatty acids from starting materials other than fats or oils:
Section 23: "Aliphatic Compounds"
Section 26: "Biomolecules and Their Synthetic Analogs"
12. Soap stocks (fatty acid metal salts): Section 46: "Surface-Active Agents and Detergents"
13. Catalyst characterization or use for test reaction only: Section 67: "Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms"
14. Manufacture of organic chemicals in which an industrial enzymic step or a fermentation step is the point of the study: Section 16: "Fermentation and Bioindustrial Chemistry"
15. Manufacture of chemicals for lubricant or fuel uses:
Section 51: "Fossil Fuels, Derivatives, and Related Products"
Section 52: "Electrochemical, Radiational, and Thermal Energy Technology"
16. Fischer-Tropsch reaction and catalysts (for general purposes with no emphasis on specific products): Section 51: "Fossil Fuels, Derivatives, and Related Products"
17. Specific uses of industrial organic chemicals which fall within the scope of a more specific section: Appropriate section according to use (e.g., Freon substitutes as degreasing agents: Section 46: "Surface-Active Agents and Detergents")
18. Excluded from coverage in CA:
Potential utilization of fats, oils, and waxes.

C. Cross-References

1. A.10, A.11, A.13 - Analysis with emphasis on methodology:
Section 79: "Inorganic Analytical Chemistry"
Section 80: "Organic Analytical Chemistry"
2. A.11 - Property studies with substantial physical chemistry interest: Cross-refer to appropriate physical chemistry section.

D. Subsection Arrangement

0. Reviews
 1. General
 2. Leather and Fur
 - Tanning
 - Collagen
 - Animal glues
 3. Fats and waxes
 - Natural waxes
 - Synthetic waxes
 4. Manufacture of industrial organic chemicals
 5. Applications of industrial organic chemicals
- Hides, skins, and pelts
 - Gelatin
 - Fats, oils, and fatty acids

Appendix - List of Common Industrial Organic Chemicals

Acetaldehyde	Isobutylene (M)
Acetic acid (synthetic)	Isopropyl alcohol
Acetone	Maleic anhydride (M)
Acrylonitrile (M)	Methanol (synthetic)
Aniline	Methyl chloride
Benzene	Methyl ethyl ketone
Bisphenol A (M)	Methyl methacrylate (M)
1,3-Butadiene (M)	Methylchloroform
1-Butanol	Methylene chloride
Caprolactam (M)	Octanol
Carbon tetrachloride	Phenol (synthetic)
Chloroform	Phthalic anhydride (M)
Cumene	Propylene (M)
Cyclohexane	Propylene glycol
Diocetyl phthalate	Styrene (M)
Ethanol (synthetic)	Terephthalic acid (M)
Ethanolamines	Terephthalic acid, dimethyl ester (M)
Ethylbenzene	Tetrachloroethylene
Ethyl chloride	Toluene
Ethylene (M)	Tolylene diisocyanate (M)
Ethylene dichloride	Urea
Ethylene glycol	Vinyl acetate (M)
Ethylene oxide (M)	Vinyl chloride (M)
2-Ethylhexanol	<i>o</i> -Xylene
Formaldehyde (M)	<i>p</i> -Xylene

While most of the above industrial organic chemicals are placed in Section 45, some are considered to be common monomers and are placed in the appropriate macromolecular chemistry section. (See List of Common Monomers at end of section 35. Section 35: "Chemistry of Synthetic High Polymers")

Compounds that are on the List of Common Monomers are indicated with (M).

This is not an exhaustive list, and other common industrial organic chemicals will be added as they are identified.

Section 46: Surface-Active Agents and Detergents

A. Coverage in This Section

1. Preparation, chemical and physical properties, gross biochemical effects, analysis, and uses of cleaning compositions and their components (e.g., soaps, syndets, detergent builders, dry-cleaning solvents for finished garments). (See B.1-B.5, C.1)
2. Preparation, properties, and analysis of surface-active agents for uses other than cleaning or with no use specified. (See B.1-B.6, C.1)

B. Alternative Placement and Exclusion from Coverage in CA

1. Specific applications of surfactants: Appropriate section according to specific subject (e.g., Section 37: "Plastics Manufacture and Processing" for polyurethane foam formulations; Section 54: "Extractive Metallurgy" for ore-flotation agents; Section 51: "Fossil Fuels, Derivatives, and Related Products" for detergent additives for gasoline and lubricants; Section 62: "Essential Oils and Cosmetics" for cosmetic formulations).
2. Chemical cleaning of metals:
Section 55: "Ferrous Metals and Alloys"
Section 56: "Nonferrous Metals and Alloys"
3. Chemical cleaning of textile materials (not finished garments): Section 40: "Textiles and Fibers"
4. Biodegradability studies:
Section 60: "Waste Treatment and Disposal"
Section 61: "Water"
5. Physical chemistry studies of surface-active agents and dispersions when emphasis is on the physical chemistry rather than the material: Section 66: "Surface Chemistry and Colloids"
6. Preparation of substances identified as surfactants but with no property or use data to support the presence of surface activity: Appropriate organic section.

C. Cross-References

1. A.1 and A.2 - Analysis with emphasis on methodology:
Section 79: "Inorganic Analytical Chemistry"
Section 80: "Organic Analytical Chemistry"

D. Subsection Arrangement

0. Reviews
 1. General
 2. Soaps
 3. Preparation, analysis, and properties of surfactants other than soaps
 - Anionic (e.g., sulfonates)
 - Cationic (e.g., quaternary ammonium salts)
 - Nonionic (e.g., alkyl phenyl ethers or polyalkylene glycols)
 - Amphoteric
4. Surfactant uses other than for cleaning

- Dispersants
 - Wetting agents
 - Emulsifiers
 - Foaming agents
 - Defoamers
 - Flocculating agents
5. Cleaning of finished garments
 - Detergent builders
 - Dry-cleaning solvents
 - Laundering detergents
 - Fabric softeners
 6. Cleaning compositions
 - Dishwashing detergents
 - Degreasing compositions
 - Household cleaners

Section 47: Apparatus and Plant Equipment

A. Coverage in This Section

1. Apparatus and equipment components used in pilot and industrial plants for carrying out unit operations (e.g., distillation, filtration, extraction) and unit processes (e.g., nitration, halogenation, hydrogenation). (See B.1 and B.2)
2. Industrial thermometric devices, refrigerative and cryogenic apparatus, baths, furnaces, boilers, heat exchangers, and heat pumps.
3. Laboratory equipment and apparatus. (See B.1 and B.2)
4. Industrial control equipment. (See B.1 and B.2)
5. General aspects of materials, including nondestructive testing, and materials of construction of apparatus. (See B.3, B.4 and C.1)

B. Alternative Placement and Exclusion from Coverage in CA

1. Equipment and apparatus with a specific application (e.g. filters for water, pulping equipment in paper manufacture, equipment for chemical analysis): Appropriate section according to use.
2. Apparatus and devices for operation and control in nuclear energy installations. Section 71: "Nuclear Technology"
3. Material testing methods based on radiation: Section 71: "Nuclear Technology"
4. Excluded from coverage in CA:
 - a. Mechanical and industrial engineering aspects of equipment design.
 - b. Mechanical alterations of equipment or machinery auxiliary to primary equipment if not directly related to improvement of the chemical operation.

C. Cross-References

1. A.5 - Cross-refer to appropriate material section.

D. Subsection Arrangement

0. Reviews
1. Multipurpose apparatus
 - Contactors
 - Plates
 - Column packings
2. Separating apparatus
 - Centrifuges
 - Stills
 - Evaporators
 - Extractors
 - Filters
 - Ion exchangers
 - Settlers
 - Thickeners

3. Chemical reaction apparatus
 - Ammoniators
 - Converters
 - Autoclaves
 - Reactors
4. High- and low-temperature apparatus
 - Boilers
 - Burners
 - Combustors
 - Condensers
 - Coolers
 - Cryogenic devices
 - Dewars
 - Dryers
 - Furnaces
 - Heat exchangers
 - Kilns
 - Liquefiers
5. Mixing apparatus
 - Agitators
 - Blenders
 - Impellers
 - Mixers
 - Mullers
 - Stirrers
6. Size-reduction and enlargement apparatus
 - Crushers
 - Flakers
 - Granulators
 - Grinders
 - Mills
 - Pulverizers
 - Agglomerators
 - Pelletizers
7. Material handling apparatus
 - Bins
 - Bunkers
 - Conveyors
 - Ducts
 - Kettles
 - Pumps
 - Vessels

8. Instrumentation and control apparatus
 - Colorimeters
 - Controllers
 - Counters
 - Detectors
 - Sensors
 - Flowmeters
 - Gages
 - Regulators
 - Viscometers
9. Materials of construction
10. Other

Section 48: Unit Operations and Processes

A. Coverage in This Section

1. Industrial unit operations (process steps involving physical changes: heat transfer, mass transfer, momentum transfer, distillation, fluid flow). (See B.1 and B.4)
2. Industrial unit processes (process steps involving chemical changes, e.g., alkylation, hydrogenation, esterification, combustion and flame studies of materials). (See B.1, B.6, B.7)
3. Thermodynamic properties of heat transfer fluids and working fluids when used in engineering apparatus and processes. (See B.2, C.1)
4. Absorption of gases by liquids, gases by solids, and liquids by solids for industrial scale separation, with or without chemical reactions. (See B.3-B.5, C.2)
5. Chemical engineering and design of operations and processes in industries. (See B.1 and B.3)
6. Process control methodology. (See B.1 and B.3)
7. Simulation and modeling methods for industrial operations and processes. (See B.1-B.3)

B. Alternative Placement and Exclusion from Coverage in CA

1. Industrial unit operations and processes for production and treatment of specific substances: Appropriate section according to the substance.
2. Physicochemical properties and processes of substances. Appropriate physical chemistry section according to the property or process studied.
3. Absorption processes in industrial scale production of specific substances: Appropriate section according to substance.
4. Absorption processes in environmental media: Appropriate environmental section, e.g.,
Section 59: "Air Pollution and Industrial Hygiene"
Section 60: "Waste Treatment and Disposal"
Section 61: "Water"
Section 19: "Fertilizers, Soils, and Plant Nutrition"
5. Absorption in analytical chemistry: Appropriate analytical section.
6. Heat transfer and heat storage when related to energy technology: Section 52: "Electrochemical, Radiational, and Thermal Energy Technology"
7. Combustion and flame studies of fuels: Appropriate section for the fuel studied.

C. Cross-References

1. A.3 - Section 69: "Thermodynamics, Thermochemistry, and Thermal Properties"
2. A.4 - Section 66: "Surface Chemistry and Colloids"

D. Subsection Arrangement

0. Reviews
1. Separation Processes
 - Distillation
 - Ion exchange
 - Adsorbents
 - Filtration
 - Evaporation
 - Settling
 - Absorbents
 - Extraction
 - Preparative chromatography
 - Ion exchangers
2. Mixing Processes
3. Processes involving size reduction and enlargement
4. Material handling processes
5. Heat transfer
6. Mass transfer
7. Fluid flow
8. Unit processes (chemical changes involved)
 - Acylation
 - Halogenation
 - Alkylation
 - Combustion
 - Flames
9. Design data and fundamentals
10. Process control, optimization, modeling
11. Other

Section 49: Industrial Inorganic Chemicals

A. Coverage in This Section

1. Industrial-scale preparation and purification of new and known inorganic substances, and chemical and physical properties that characterize such substances, including:
 - a. elements (including carbon and its allotropic forms, diamond, graphite, and fullerenes not containing organic substituents);
 - b. inorganic compounds (acids, bases, metal oxides, synthetic minerals and molecular sieves, salts and double salts, clathrates and other intercalation compounds, charge-transfer complexes);
 - c. carbon-containing compounds not appropriate for placement in the organic sections: carbon oxides and sulfides, carbides, metal carbonyls and thiocarbonyls, cyanides, isocyanides, cyanates, isocyanates, thiocyanates, carbonates, metal salts of carboxylic acids and alcohols, alcoholates and other solvates;
 - d. coordination compounds containing inorganic and/or organic ligands (including models for biological systems when primary emphasis is on the preparation);
 - e. metalloid and other nonmetal compounds (without organic substituents): ammonium salts, interhalogens, chalcogen and pnictogen halides and oxides, borazines, phosphonitriles, rare gas compounds, etc.;
 - f. intermetallic compounds. (See B.1-B.11, B.15-18, C.1)
2. Characterization (compositions, physicochemical properties, molecular structure, etc.) of new and known inorganic substances when the emphasis is on the substance, rather than on particular properties and/or uses or on methods by which composition, properties, etc. are studied. (See B.1- B.11, B.14, C.1)
3. Nonpreparative industrial-scale reactions of inorganic compounds without emphasis on mechanism or kinetics (including thermal decomposition and other degradation reactions, and natural mineral reactions that are not carried out for the purpose of simulating naturally occurring mineralogical processes). (See B.2, B.6, B.7, B.13)
4. Extraction of inorganic compounds and nonmetallic elements from ores. (See B.15).

B. Alternative Placement and Exclusion from Coverage in CA

1. Nonindustrial preparations and applications: Section 78: "Inorganic Chemicals and Reactions" or section appropriate to the material or use.
2. Physical chemistry (e.g., kinetics and thermodynamics of reactions; crystallographic, electrical, magnetic, optical, etc. properties): Appropriate physical chemistry sections, e.g.,
Section 67: "Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms"
Section 68: "Phase Equilibria, Chemical Equilibria, and Solutions"
Section 69: "Thermodynamics, Thermochemistry, and Thermal Properties"
Section 73: "Optical, Electron, and Mass Spectroscopy and Other Related Properties"
unless the preparation method is emphasized.
3. Compounds with carbon-metal and carbon-metalloidal bonds (other than those listed in A.1.c), and organic derivatives of oxo (thioxo, etc.) acids of boron and the Group VA (Group 15) elements: Section 29: "Organometallic and Organometalloidal Compounds"
Industrial organometallic and organometalloidal compounds: Section 45: "Industrial Organic Chemicals, Leather, Fats, and Waxes"
4. Carbon products: Section 57: "Ceramics"
5. Inorganic polymers (compounds with structures represented by repeating units with degree of polymerization greater than about 10):
Section 35: "Chemistry of Synthetic High Polymers"
Section 36: "Physical Properties of Synthetic High Polymers"
6. Electrochemical preparations and reactions with emphasis on the electrochemistry: Section 72: "Electrochemistry"

7. Photochemical and radiochemical preparations and reactions with emphasis on the photochemistry or radiochemistry: Section 74: "Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes"
8. Preparation of catalysts: Section 67: "Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms" or section appropriate for the reaction emphasized.
9. Preparation of phosphors: Section 73: "Optical, Electron, and Mass Spectroscopy and Other Related Properties"
10. Preparation of liquid crystals: Section 75: "Crystallography and Liquid Crystals"
11. Mineralogical and geological chemistry, including reactions carried out for the purpose of simulating naturally occurring processes: Section 53: "Mineralogical and Geological Chemistry"
12. Hydriding of alloys and intermetallic compounds for the purpose of hydrogen storage for fuel use: Section 52: "Electrochemical, Radiational, and Thermal Energy Technology"
13. Surface reactions not preparative in nature:
Section 66: "Surface Chemistry and Colloids"
Section 67: "Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanism"
or other appropriate section.
14. Chemical analysis of inorganic compounds: Section 79: "Inorganic Analytical Chemistry" or other appropriate section that includes analysis coverage.
15. Extraction of metals: Section 54: "Extractive Metallurgy"
16. Metallurgical processes and products:
Section 55: "Ferrous Metals and Alloys"
Section 56: "Nonferrous Metals and Alloys"
17. Ceramic Materials and Technology: Section 57: "Ceramics"
18. Structural Materials: Section 58: "Cement, Concrete, and Related Building Materials"

C. Cross-References

1. A.1 and A.2 - For preparation of coordination complexes with stated interest as biochemical models, cross refer to Section 6: "General Biochemistry," Section 7: "Enzymes", or other appropriate Biochemistry section.

D. Subsection Arrangement

0. Reviews
1. Elements
2. Acids
3. Bases and Metal Oxides
 - Hydroxides
4. Synthetic Minerals
5. Salts (including acid salts and metal borides, carbides, and nitrides)
 - Halides, pseudohalides
 - Chalcogenides
 - Pnictides
 - Carbonates, nitrates, sulfates, phosphates, etc.
 - Hydrides, borides, carbides, silicides, etc.

6. Double Salts
7. Coordination Compounds
 - Coordinated metals and nonmetals
 - Metal carbonyls
 - Heteropoly acids and salts
 - Cluster compounds (coordinative)
 - Addition compounds (clathrates, intercalation compounds)
 - Charge-transfer complexes
8. Nonmetal Compounds
 - Interhalogens
 - Compounds of boron, carbon, silicon, nitrogen, phosphorus, arsenic, the chalcogens and the rare gases
9. Systems and physical methods for separating inorganic substances
10. Reactions (oxidation, reduction, etc.)
11. Other
 - Intermetallic compounds
 - Heteroatom clusters (noncoordinative)
 - General topics

Section 50: Propellants and Explosives

A. Coverage in This Section

1. Preparation, formulation, and application of rocket fuels and propellants. (See B.1, B.4, B.5, B.9, C.1)
2. Preparation, formulation, and application of explosives, igniting powders, and pyrotechnics. (See B.1, B.5, C.1)
3. Deliberate explosions, including air bags, explosion propagation, and flame propagation of propellants, explosives, and pyrotechnics. (See B.2, B.6)
4. Safety in use and handling of explosives, propellants, igniting powders, and pyrotechnics. (See B.7, B.8)
5. General studies on fire-extinguishing compositions and flammability-reducing agents. (See B.3)
6. Incendiary materials and matches.
7. Analysis of rocket fuels, propellants, and explosives.
8. Ionic propulsion and electromagnetic thrust propulsion.

B. Alternative Placement and Exclusion from Coverage in CA

1. Synthesis of individual component substances for rocket fuels and propellants: Appropriate section for the substance.
2. Spontaneous combustion, explosion susceptibility, and destructive fires: Appropriate section for the material studied.
3. Specific fire-extinguishing compositions or flammability-reducing agents: Appropriate section for the components or materials being protected, e.g., for fabrics, Section 40: "Textiles and Fibers"
4. Materials studies on rocket engines: Section 47: "Apparatus and Plant Equipment"
5. Nuclear propellants and explosives; nuclear devices: Section 71: "Nuclear Technology"
6. Combustion and flame studies of materials other than propellants, explosives, igniting powders, and pyrotechnics: appropriate section according to the material: e.g., fossil fuels and blends, Section 51: "Fossil Fuels, Derivatives, and Related Products"
7. Disposal of explosives, igniting powders, pyrotechnics, rocket fuels, and propellants: Section 60: "Waste Treatment and Disposal"
8. Pollution by explosives, igniting powders, pyrotechnics, rocket fuels, and propellants: appropriate section for the environmental medium being polluted.
9. Aerosol propellants: appropriate section according to the use, e.g., hair spray, Section 62: "Essential Oils and Cosmetics"
10. Excluded from coverage in CA:
Mechanical design of rocket engines.

C. Cross-References

1. A.1 and A.2, polymeric binders, cross-refer to Section 38: "Plastics Fabrication and Uses"

D. Subsection Arrangement

0. Reviews
1. Propellants
 - Rocket fuels
 - Other uses (e.g., for safety bags, weaponry)
2. Explosives, ignitors, and detonators

3. Incendiaries, pyrotechnics, smoke generators, etc.
4. Ignition, detonation, and explosion studies
5. Flame studies
6. Fire extinguishers
7. Ionic and other propulsion modes
8. Other

Section 51: Fossil Fuels, Derivatives, and Related Products

A. Coverage in This Section

1. Chemistry and chemical engineering of extraction, production and processing of fossil fuels (e.g., petroleum, natural gas, and coal).
2. Uses of fossil fuels and fossil fuel blends with other combustible materials e.g., alcohols, industrial organic chemicals, wastes. (See B.8, B.9)
3. Geochemistry, including location, origin, and description of petroleum, natural gas, oil shale, tar sands, coal, and other fossil-fuel deposits as they occur in the earth's crust. (See C.1)
4. Chemistry, composition, and properties of drilling muds. (See B.4)
5. Thermal and catalytic cracking, reforming, isomerization, alkylation, denitrogenation, and desulfurization of petroleum.
6. Catalysts for and production of hydrocarbon fuels and related products:
 - a.oxidative coupling of methane to higher alkanes
 - b.hydrogenation of carbon oxides to alcohols, when related to fuel and lubricant composition
 - c.Fischer-Tropsch reaction, either for general studies or those specifically related to fuels and lubricants
 - d.methanol conversion to gasoline
 - e.zeolites and other catalysts (See B.7)
7. Coal conversion (coking, gasification, liquefaction, and pyrolysis) and the products of these transformations. (See B.7)
8. Production, treatment, and uses of fossil-fuel products and their derivatives:

a. synthetic gaseous fuels	g.lubricants and greases
b. gasoline	h.asphalts
c. jet fuel	i. bitumen
d. naphtha	j. coke
e. gas oil	k.additives
f. diesel fuel	l. other products

 (See B.3, B.5, B.7, B.10, B.11)
9. Synthetic lubricants and hydraulic fluids (e.g., ester-based compositions and polysiloxanes). (See B.10, B.11)
10. Combustion, flame studies, and thermal properties of fossil fuels, their derivatives, and mixtures with other materials. (See B.9)
11. Analysis of fossil fuels and their derivatives.
12. Safety aspects of fossil fuel production and processing. (See B.13)

Note: For a list of common industrial organic chemicals, see Appendix at the end of Section 45: "Industrial Organic Chemicals, Leather, Fats, and Waxes"

For A list of common monomers, see Appendix at the end of Section 35: "Chemistry of Synthetic High Polymers"

B. Alternative Placement and Exclusion from Coverage in CA

1. Purification of automotive exhaust gas and treatment of stack gases from coal, fuel oils: Section 59: "Air Pollution and Industrial Hygiene"
2. Paving compositions: Section 58: "Cement, Concrete, and Related Building Materials"
3. Synthesis (with no demonstration of use) of additives for lubricants, fuels, and other petroleum and coal-related products: Appropriate organic or inorganic section. (See C.2)
4. Petroleum well cementing compositions: Section 58: "Cement, Concrete, and Related Building Materials" (See C.2)

5. Manufacture of industrial chemicals from petroleum and coal: Section 45: "Industrial Organic Chemicals, Leather, Fats, and Waxes"
6. Oil field and natural gas field brines:
Chemistry of water, Section 61: "Water"
Geochemistry of brines, Section 53: "Mineralogical and Geological Chemistry"
7. Fischer-Tropsch reaction for manufacture of specific industrial organic chemicals and chemical feedstocks: If use as fuel is not explicitly stated: Section 45: "Industrial Organic Chemicals, Leather, Fats, and Waxes"
If common monomers: Appropriate macromolecular section.
8. Uses of nonfossil fuels, when not in blends: Section 52: "Electrochemical, Radiational, and Thermal Energy Technology"
9. Combustion and incineration of wastes when the emphasis is on waste disposal: Section 60: "Waste Treatment and Disposal"
10. Manufacture of sliding materials containing self-lubricants, when the emphasis is not in the lubricants: appropriate section for the material.
11. Lubricants for metals when the emphasis is on the metal or the process: appropriate metal and alloy section.
12. Carbon products: Section 57: "Ceramics"
13. Industrial hygiene and occupational exposure aspects of safety: Section 59: "Air Pollution and Industrial Hygiene"
14. Excluded from coverage in CA:
 - a. Mining and petrography
 - b. Plant development and capacities
 - c. Mechanical engine modification or engine design.

C. Cross-References

1. A.3 - Section 53: "Mineralogical and Geological Chemistry"
2. B.3 and B.4 - Section 51: "Fossil Fuels, Derivatives, and Related Products"

D. Subsection Arrangement

0. Reviews
1. Petroleum geochemistry and prospecting
2. Petroleum production
 - Drilling fluids
 - Well treating
 - Primary, secondary, and tertiary recovery
3. Petroleum analysis and properties
4. Crude oil refining
 - Emulsion Breaking
 - Distillation
5. Natural gas
 - Natural gas substitutes
 - Production and well treatment

6. Manufacture of gasoline hydrocarbons (including catalysts used)
 - Alkylation
 - Conversion
 - Cracking
 - Hydroforming
 - Hydrogenation
 - Isomerization
 - Polymerization
 - Reforming (Platforming)
 - Fischer-Tropsch reaction
7. Gasoline formulations
 - Analysis
 - Additives and gum inhibitors
 - Blends
 - Octane number improvement and determination
 - Gasohol
8. Lubricants and functional fluids
 - Analysis
 - Solvent refining
 - Dewaxing
 - Compounding and blending
 - Additives
 - Cutting oils
 - Transformer oil
 - Greases
 - Sulfonates
 - White oils
 - Hydraulic fluids
 - Solid lubricant coatings
9. Other petroleum fractions
 - LPG and other gases
 - Diesel fuel and extenders, including manufacture by Fischer-Tropsch synthesis
 - Diesel fuel
 - Gas oil
 - Kerosine
 - Naphtha
 - Mineral spirits
10. Petroleum residues
 - Asphalts and emulsions
 - Bitumens
 - Coke
11. Special products from petroleum
 - Acid sludge recovery
 - Naphthenic acids
 - Natural petroleum resins
 - Waxes
 - Antifreeze compositions
 - Petroleum chemicals
 - Synthetic fuel gases
 - Fischer-Tropsch products
12. Combustion of petroleum substances and natural gas
 - Fuel gases
 - Fuels
 - Combustion catalysts
13. Oil shale technology
 - Kerogen
14. Tar sands technology
 - Bitumens
15. General studies on coal and lignite (brown coal)
16. Coal and lignite (brown coal) analysis and properties
17. Coal and lignite (brown coal) preparation
 - Flotation
 - Desulfurization

18. Coal and lignite (brown coal) combustion, including aqueous and oil slurries
19. Coal and lignite (brown coal) carbonization and products
20. Coal and lignite (brown coal) gasification
21. Coal and lignite (brown coal) hydrogenation, liquefaction, and reactions
 - Liquid fuels
 - Chemicals and gaseous fuels from liquefaction
22. Peat, asphaltites and asphaltoids, and lignite (brown coal) formation, deposits, and general studies
 - Montan wax
 - Humic acids
 - Gilsonite
 - Wurtzilite
23. General engineering studies (coal and petroleum)
 - Process simulation and control
 - Design
 - Equipment
 - Corrosion
 - Antifouling
24. Other (coal and petroleum)
 - Storage
 - Pipelines
 - Briquetting
 - Mine gases

Section 52: Electrochemical, Radiational, and Thermal Energy Technology

A. Coverage in This Section

1. Chemical, biochemical, electrochemical, photochemical, and chemical engineering aspects of energy sources. (See B.1- B.3, B.5, B.12, B.14, C.4)
 - a.Solar energy
 - b.Ocean thermal energy
 - c.Geothermal energy
 - d.Other nonfossil energy sources
2. Photoinduced redox reactions and artificial photosynthesis when used in solar energy conversion and storage devices. (See B.4, B.5, C.4)
3. Recovery and use of waste heat and low grade heat. (See B.6)
4. Hydrogen manufacture for fuel use by photolytic, biophotolytic, photoelectrochemical, and thermochemical processes if solar energy is involved. (See B.7, B.8, C.1)
5. Fuel manufacture from biomass, including agricultural wastes, wood and wood residues, municipal wastes, and energy crops. (See B.9, B.10, C.2)
6. Combustion of wood and other nonfossil fuels and combustion of wastes when used as fuels, including flame studies. (See B.11, B.17)
7. Energy conversion technology and energy conversion devices, including device components. (See B.3, B.12, B.13, B.14, C.3, C.4)
 - a.Batteries and fuel cells
 - b.Solar cells and solar photoelectrochemical cells
 - c.Thermoelectric devices
 - d.Solar thermal electric generators and systems
 - e.Other devices related to nonfossil energy conversion
8. Chemical and chemical engineering aspects of handling, transport, and storage of thermal, solar, and geothermal energy, and of nonfossil fuels. (See B.2, B.14, B.17)
9. Safety aspects of thermal, solar, and geothermal energy and nonfossil fuels. (See B.2, B.3, B.16)
10. Hydriding of alloys and intermetallic compounds when related to storage of hydrogen fuel. (See B.18).

B. Alternative Placement and Exclusion from Coverage in CA

1. Propellant fuels and explosives: Section 50: "Propellants and Explosives"
2. Petroleum technology, fossil fuels, and fossil fuel blends with nonfossil fuels: Section 51: "Fossil Fuels, Derivatives, and Related Products"
3. Nuclear fuels, nuclear reactors, nuclear batteries and nuclear auxiliary power systems, including thermoelectric cells, thermionic energy converters, and other devices when associated with design and operation of nuclear power systems: Section 71: "Nuclear Technology"
4. Natural and artificial photosynthesis with no goal for solar energy conversion and storage:
Section 10: "Microbial, Algal, and Fungal Biochemistry"
Section 11: "Plant Biochemistry"
5. Photochemical systems: Section 74: "Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes"; photochemical reactions, appropriate section for the reaction under study.
6. Waste heat recovery and reuse within industrial processes: Appropriate section for the process.

7. Industrial scale manufacture and purification of hydrogen: Section 49: "Industrial Inorganic Chemicals"
Nonindustrial scale preparation of hydrogen: Section 78: "Inorganic Chemicals and Reactions"
8. Manufacture of hydrogen by electrolysis: Section 72: "Electrochemistry"
9. Treatment of wood and agricultural residues by acid and enzymic hydrolysis, liquefaction, or other methods, not including final conversion to fuel:
Section 16: "Fermentation and Bioindustrial Chemistry"
Section 43: "Cellulose, Lignin, Paper, and Other Wood Products"
10. Industrial scale manufacture of chemicals, including methanol or ethanol if their use as fuel is not explicitly stated: Section 45: "Industrial Organic Chemicals, Leather, Fats, and Waxes"
11. Combustion of wastes for disposal and incineration of wastes: Section 60: "Waste Treatment and Disposal"
12. Fundamental aspects of electrochemical systems: Section 72: "Electrochemistry"
Electric properties and uses of materials in electric and electronic devices: Section 76: "Electric Phenomena"
13. Magnetic properties of materials and principles of magnetohydrodynamics: Section 77: "Magnetic Phenomena"
14. Standard electrochemical cells: Section 72: "Electrochemistry"
15. Thermodynamic properties of working fluids used in energy conversion engines and heat pumps: Section 48: "Unit Operations and Processes"
16. Industrial hygiene and occupational exposure aspects of safety: Section 59: "Air Pollution and Industrial Hygiene"
17. Exhaust gases from engines operated with nonfossil fuels and composition and treatment of flue gases from combustion of nonfossil fuels and wastes: Section 59: "Air Pollution and Industrial Hygiene"
18. Studies of hydrides and hydriding of alloys and intermetallic compounds with no aim for storage of hydrogen fuel: Section 78: "Inorganic Chemicals and Reactions"
Physicochemical properties of hydrides: appropriate section for the property studied;
Interactions of hydrogen with metal and alloys, appropriate metal and alloy section.

C. Cross-References

1. A.4 -
Section 49: "Industrial Inorganic Chemicals"
Section 78: "Inorganic Chemicals and Reactions"
2. A.5 - Cross-refer to appropriate section for source and for synthetic product (e.g., Section 45: "Industrial Organic Chemicals, Leather, Fats, and Waxes").
3. A.7 - Section 48: "Unit Operations and Processes"
4. A. 1 and A.7 -
Section 72: "Electrochemistry" for electrochemical devices
Section 76: "Electric Phenomena" for electric systems
Section 74: "Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes" for photochemical systems.

D. Subsection Arrangement

0. Reviews
1. Energy sources
 - Solar energy
 - Ocean thermal energy
 - Geothermal energy
 - Waste heat sources
 - Fuels from fermentation, gasification, pyrolysis of biomass and wastes
 - Hydrogen fuel
 - Combustion of nonfossil fuels and wastes
2. Energy conversion devices and their components
 - Batteries
 - Fuel cells
 - Solar cells and solar photoelectrochemical cells
 - Solar thermophotovoltaic devices
 - Thermoelectric devices
 - Thermionic energy converters
 - Magnetohydrodynamic and electrohydrodynamic generators
 - Thermomagnetic energy converters
 - Other energy converters
3. Energy handling, transport, and storage
 - Heat storage and transport systems
 - Solar energy storage and transport systems
 - Solar collectors, solar ponds, solar absorbers
 - Heat pumps for use of low grade thermal energy sources
 - Hydrogen fuel storage, distribution, and transport
4. Safety aspects of energy utilization
5. Other

Section 53: Mineralogical and Geological Chemistry

A. Coverage in This Section

1. Mineralogical studies including classification, origin, crystal chemistry, crystal structure, and physicochemical properties of natural minerals. (See B.1-B.3, B.9, C.1)
2. Phase equilibrium studies related to mineral systems. (See C.2)
3. Economic geology including prospecting methods, classification, composition, origin of ore and salt deposits, and geothermal resources. (See B.4, B.5, B.9, C.3)
4. Biogeoprospecting (e.g., locating metal ore deposits by higher-than-normal concentrations of metals in indigenous plants). (See C.4)
5. Geochemistry and formation of rocks, sediments, and soils. (See B.6, B.7, B.9)
6. Abundance and geochemistry of elements and isotopes.
7. Chemical evidence in studies of geological age and chemistry methods for geological age determination, e.g., radioisotopes, fission tracks, thermoluminescence. (See B.9)
8. Chemistry of the atmosphere (troposphere, stratosphere, mesosphere, ionosphere, magnetosphere). (See B.6)
9. Rainmaking.
10. Glaciers and chemical studies of natural waters as indicators of geological relations and processes. (See B.7, B.9, C.5)
11. Chemistry of the solar system including planets, natural satellites of planets, asteroids, meteors, meteorites, comets, and interplanetary dust. (See B.8, B.9)

B. Alternative Placement and Exclusion from Coverage in CA

1. Methods for chemical analysis of natural minerals, rocks, sediments, inorganic soil constituents not related to plant growth, air:
Section 79: "Inorganic Analytical Chemistry"
Section 80: "Organic Analytical Chemistry"
2. Methods for the determination of inorganic soil constituents related to plant growth and determination of organic soil constituents: Section 19: "Fertilizers, Soils, and Plant Nutrition"
3. Synthetic minerals:
Industrial preparation and treatment, Section 49: "Industrial Inorganic Chemicals"
Nonindustrial preparation, Section 78: "Inorganic Chemicals and Reactions"
Structural studies, Section 75: "Crystallography and Liquid Crystals"
Or appropriate section related to intended use.
4. Economic geology of coal, natural gas, and petroleum: Section 51: "Fossil Fuels, Derivatives, and Related Products"
5. Geothermal wells and installations for electric power generation from geothermal resources: Section 52: "Electrochemical, Radiational, and Thermal Energy Technology"
6. Pollution, environmental, and ecological studies:
Of air, Section 59: "Air Pollution and Industrial Hygiene"
Of soils, Section 19: "Fertilizers, Soils, and Plant Nutrition"
Of water, Section 61: "Water"
7. Suspended sediments, interactions of sediments with waters, and water studies of nongeological interest: Section 61: "Water"

8. Cosmology:

Nuclear cosmology, Section 70: "Nuclear Phenomena"

Spectra of the Sun and other objects/phenomena outside the solar system, Section 73: "Optical, Electron, and Mass Spectroscopy and Other Related Properties"

Studies of other objects/phenomena outside the solar system, appropriate section according to material or property studied.

9. Excluded from coverage in CA:

Descriptive studies on petrofabrics, morphology, and other nonchemical aspects of petrography or ore deposits.

C. Cross-References

1. A.1 - Section 75: "Crystallography and Liquid Crystals" for crystal chemistry or to appropriate physical chemistry section for other physicochemical properties.
2. A.2 -
Section 68: "Phase Equilibriums, Chemical Equilibriums, and Solutions"
Or if emphasis is on phase transition, Section 75: "Crystallography and Liquid Crystals"
3. A.3 - For geothermal resources: Section 52: "Electrochemical, Radiational, and Thermal Energy Technology"
4. A.4 - Section 19: "Fertilizers, Soils, and Plant Nutrition"
5. A.10 - Section 61: "Water"

D. Subsection Arrangement

0. Reviews
1. Mineralogy
2. Economic Geology
3. Igneous Rocks
4. Metamorphic and Metasomatic Rocks
5. Sedimentary Rocks and Sediments
6. Soils
7. Abundance of Elements and Isotopes
8. Geochronology
9. Cosmochemistry and Meteorites
10. Atmosphere
11. Geochemistry of Water
12. Other

Section 54: Extractive Metallurgy

A. Coverage in This Section

1. Ore beneficiation and mineral processing, including comminution, classification, gravity concentration, flotation, electrostatic and magnetic separation, thickening, filtering, and drying.
2. Hydrometallurgy, including leaching, cementation (precipitation), solvent extraction, and ion exchange.
3. Pyrometallurgy, including winning, roasting, sintering, smelting, and fire refining.
4. Electrometallurgy, including electrowinning, electrorefining, and molten salt electrolysis. (See B.2 and C.1)
5. Ironmaking
 - a. Direct reduction
 - b. Smelting reduction
 - c. Blast furnace practices
 - d. Pig iron
 - e. Sponge iron (See B.1)
6. Extractive processes in manufacture of ferroalloys and nonferrous master alloys.
7. Recycling, including metal recovery from scraps, discharge slags, other wastes.

B. Alternative Placement and Exclusion from Coverage in CA

1. Pig iron refining, steelmaking, and cast iron production: Section 55: "Ferrous Metals and Alloys"
2. Electrowinning and electrorefining, if major interest is in the electrochemical process: Section 72: "Electrochemistry"

C. Cross-References

1. A.4 - Section 72: "Electrochemistry"

D. Subsection Arrangement

0. Reviews
1. Mineral dressing
 - Comminution
 - Sizing and classification
 - Concentration
 - flotation
 - magnetic separation
 - electrostatic separation
 - gravity concentration
 - panning
 - Dewatering
 - Sampling
 - jigging
 - tabling
 - sink-and-float process
 - heavy-medium separation

2. Extraction

• Hydrometallurgical

- leaching
- precipitation
- ion exchange
- solvent extraction

• Pyrometallurgical

- calcining
- roasting
- pelletizing
- sintering
- blast-furnace practice

• Electrometallurgical

3. Refining

• Electrometallurgical

• Hydrometallurgical

• Pyrometallurgical

4. Other

• smelting

• matte treatment

• distillation

• metallothermic reduction

• slags

Section 55: Ferrous Metals and Alloys

A. Coverage in This Section

1. Chemistry of iron and alloys with iron as the major component. (See B.1-B.5, B.11)
2. Steel and cast iron production. (See C.4)
3. Foundry practice, including molding and casting.
4. Powder metallurgy.
5. Cermets, metal matrix composites, and clad composites. (See C.2)
6. Heat treatment, including thermochemical and thermomechanical processes.
7. Chemical and electrochemical cleaning, etching, polishing, and surface treatments.
8. Nonelectrochemical metallic coating on iron and ferrous alloys and new nonelectrochemical methods for coating metals onto plastics. (See B.5, B.6, C.1)
9. Electrochemical metallic coating on iron and ferrous alloys, if the major interest is in the coated material and not in the electrochemical process. (See B.7)
10. Constitution, including phase transformation and phase equilibria and microstructure when metallurgical properties are emphasized. (See B.2, B.9, C.3)
11. Welding, soldering, brazing, adhesive bonding, and other joining methods.
12. Corrosion. (See B.8)
13. Recrystallization and grain growth. (See B.2)
14. Working, forming, and machining, including lubrication, when related to chemical composition or microstructure (See B.10)
15. Testing and characterization.

B. Alternative Placement and Exclusion from Coverage in CA

1. Pig iron manufacture and smelting: Section 54: "Extractive Metallurgy"
2. Crystallography of ferrous metals and alloys: Section 75: "Crystallography and Liquid Crystals"
3. Studies of two or more alloys representing both ferrous and nonferrous alloys: Section 56: "Nonferrous Metals and Alloys"
4. General analytical methods: Section 79: "Inorganic Analytical Chemistry"
5. Coating of iron and ferrous alloys on plastics by conventional methods: Section 38: "Plastics Fabrication and Uses"
6. Polymeric coatings on iron and ferrous alloys: Section 42: "Coatings, Inks, and Related Products"
7. Electrochemical metallic coating, if the major interest is in the electrochemical process: Section 72: "Electrochemistry"
8. Corrosion studies with major emphasis on the corrosion process: Section 72: "Electrochemistry"
Water treatment for prevention of waterside corrosion: Section 61: "Water"
9. Phase equilibria studies without metallurgical emphasis: Section 68: "Phase Equilibria, Chemical Equilibria, and Solutions"
10. Lubricants for metallurgical processes when the emphasis is on lubricant or lubrication methods: Section 51: "Fossil Fuels, Derivatives, and Related Products"
11. Iron and ferrous alloys for prosthetic devices, dental materials, and surgical goods: Section 63: "Pharmaceuticals"

C. Cross-References

1. A.8 - For coating of plastics, Section 38: "Plastics Fabrication and Uses"

2. A.5 - For cermets, Section 57: "Ceramics"
3. A.10 - Section 68: "Phase Equilibriums, Chemical Equilibriums, and Solutions"
4. A.2 - For magnetic iron alloys, Section 77: "Magnetic Phenomena"

D. Subsection Arrangement

0. Reviews
1. Cast iron and steelmaking processes
2. Cast iron and steel foundry practice
 - Casting
 - Molds and cores
3. Alloys - compositions for special uses
4. Powder metallurgy, cermets, and metal composites
 - Matrix composites
 - Clad composites
5. Heat treatment
 - Homogenization
 - Solution annealing
 - Austenitizing
 - Annealing
 - Normalizing (thermal)
 - Recrystallization
 - Aging, maraging
 - Stress-relieving
 - Tempering, austempering, martempering
 - Laser hardening
6. Surface treatment, metallic and nonmetallic coating, sealing, cleaning, polishing, etching, and pickling
7. Thermochemical treatment
 - Cementation
 - Carburization
 - Nitridation
 - Carbonitridation
 - Case-hardening
 - Internal oxidation
8. Structure, phase transformation, and phase equilibrium
9. Joining
 - Brazing
 - Soldering
 - Welding
 - Cladding
 - Adhesive bonding
10. Corrosion (if the primary interest is in the metal), erosion, cavitation, tribology, and oxidation

11. Working and machining
 - Forming
 - Rolling
 - Forging
 - Extruding
 - Stamping
 - Drawing
 - Swaging
 - Chemical milling
 - Electrodischarge machining
 - Thermomechanical treatment
12. Physical and mechanical properties
13. Other

Section 56: Nonferrous Metals and Alloys

A. Coverage in This Section

1. Chemistry of nonferrous metals and alloys containing no iron or iron as a minor alloying element. (See B.1, B.2, C.4)
2. Manufacture of nonferrous metals and alloys, including melting. (See B.7, B.10-B.13)
3. Foundry practice, including molding and casting.
4. Powder metallurgy.
5. Cermets, metal matrix composites, and clad composites. (See C.2)
6. Heat treatment, including thermochemical and thermomechanical processes.
7. Chemical and electrochemical cleaning, etching, polishing and surface treatments.
8. Nonelectrochemical metallic coating on nonferrous metals and alloys, including new methods for coating metals onto plastics. (See B.3, B.4, C.1)
9. Electrochemical metallic coating, if the major interest is in the coated material and not in the electrochemical process. (See B.5)
10. Constitution, including phase transformation and phase equilibria and microstructure when metallurgical properties are emphasized. (See B.8)
11. Welding, soldering, brazing, adhesive bonding, and other joining methods.
12. Corrosion. (See B.6)
13. Studies on two or more metals or alloys representing both ferrous and nonferrous metals or alloys. (See B.10-B.13)
14. Recrystallization and grain growth. (See B.1)
15. Working, forming, and machining, including lubrication, when related to chemical composition or microstructure. (See B.9)
16. Testing and characterization.

B. Alternative Placement and Exclusion from Coverage in CA

1. Crystallography of nonferrous metals and alloys: Section 75: "Crystallography and Liquid Crystals"
2. General analytical methods: Section 79: "Inorganic Analytical Chemistry"
3. Metallic coating on plastics by conventional methods: Section 38: "Plastics Fabrication and Uses"
4. Polymeric coatings on nonferrous metals and alloys: Section 42: "Coatings, Inks, and Related Products"
5. Electrochemical metallic coating, if the major interest is in the electrochemical process: Section 72: "Electrochemistry"
6. Corrosion studies with major emphasis on the corrosion process: Section 72: "Electrochemistry"
Water treatment for prevention of waterside corrosion: Section 61: "Water"
7. Smelting: Section 54: "Extractive Metallurgy"
8. Phase equilibria studies without metallurgical interest: Section 68: "Phase Equilibriums, Chemical Equilibriums, and Solutions"
9. Lubricants for metallurgical processes when the emphasis is on lubricant or lubrication methods: Section 51: "Fossil Fuels, Derivatives, and Related Products"
10. Metals and alloys for storage of hydrogen fuel and for energy conversion devices: Section 52: "Electrochemical, Radiational, and Thermal Energy Technology"
11. Metals and alloys for nuclear technology devices and uses: Section 71: "Nuclear Technology"

12. Metals and alloys for electric and electronic devices: Section 76: "Electric Phenomena"
13. Metals and alloys for prosthetic devices, dental materials, surgical goods, etc.: Section 63: "Pharmaceuticals"
(See C.5)

C. Cross-References

1. A.8 - For metal coatings onto plastics, Section 38: "Plastics Fabrication and Uses"
2. A.5 - For cermets, Section 57: "Ceramics"
3. A.10 - Section 68: "Phase Equilibriums, Chemical Equilibriums, and Solutions"
4. A.1 - For properties, cross-refer to appropriate section, e.g., electrically conductive alloys, Section 76: "Electric Phenomena"
5. B.13 - Section 56: "Nonferrous Metals and Alloys"

D. Subsection Arrangement

0. Reviews
1. Alloy preparation, melting, melt treatment, and ingot preparation
2. Foundry practice
 - Casting
 - Molds and cores
 - Ingot remelting
3. Alloys - compositions for special uses
4. Powder metallurgy, cermets, and metal composites
5. Heat treatment
 - Homogenizing or solution-annealing
 - Annealing
 - Recrystallization
 - Aging
 - Stress-relieving
6. Surface treatment, metallic and nonmetallic coating, sealing, cleaning, polishing, etching, and pickling.
7. Thermochemical treatment
 - Cementation (diffusion coating)
 - Carburization
 - Nitridation
 - Carbonitridation
 - Internal oxidation
 - Siliconization
 - Boronization
 - Anodization
8. Structure, phase transformation, and phase equilibrium
9. Joining
 - Brazing
 - Soldering
 - Welding
 - Cladding
 - Adhesive bonding
10. Corrosion (if the primary interest is in the metal), erosion, cavitation, tribology, and oxidation

11. Working and machining
 - Forming
 - Rolling
 - Extruding
 - Stamping
 - Drawing
 - Swaging
 - Chemical milling
 - Electrodischarge machining
12. Physical and mechanical properties
13. Other

Section 57: Ceramics

A. Coverage in This Section

1. Chemical composition and analysis of glasses, glass systems, and ceramics. (See B.7, B.13, C.1)
2. Manufacture, properties, uses of ceramics and glasses, including glass fibers and ceramic fibers, ceramic matrix composites, advanced ceramics, and recycling of glasses. (See B.1, B.2, B.3-B.6, B.10, B.12)
3. Bonding and joining of ceramics to metals and glasses to metals, when the emphasis is in the ceramic or glass. (See B.9, C.2)
4. Chemical composition, manufacture, structure, properties, and analysis of clay products, including brick and tile, porcelain, china, vitreous enamels, and enamelware. (See B.7, B.8)
5. Refractories and abrasives. (See B.1, B.5, B.11)
6. Carbon products, e.g., carbon fibers, films, and filaments; carbon fiber-carbon composites; pyrolytic carbon or graphitization products. (See B.6 and B.12)
7. Coating of ceramics, ceramic coatings, and enameling, glazing, and other processes for coating with ceramics and glasses. (See B.3, B.13)

B. Alternative Placement and Exclusion from Coverage in CA

1. Nuclear reactor applications of ceramics: Section 71: "Nuclear Technology"
2. Physicochemical phase studies on ceramic materials and glassy systems: Section 68: "Phase Equilibriums, Chemical Equilibriums, and Solutions"
3. Electrical properties and applications of ceramics and glasses without emphasis on the technology of manufacture and processing: Section 76: "Electric Phenomena"
4. Fundamental studies of amorphous and vitreous forms of matter: Section 65: "General Physical Chemistry"
Crystallographic studies and methodology: Section 75: "Crystallography and Liquid Crystals"
5. Organic glasses: Section 37: "Plastics Manufacture and Processing"
Metallic glasses and refractory metals and alloys: appropriate metallurgy section.
6. Carbon fibers and glass fibers for fabrics, for reinforcement, or for packings: appropriate section according to use of product.
7. Raw materials, minerals, ores, sand, and clay studies in which site, compositions, properties, and other geological information are given and the uses in ceramic and refractory industries are incidental: Section 53: "Mineralogical and Geological Chemistry"
8. Manufacture of inorganic raw materials which are not limited to use in the ceramic and refractory industries or are not identified specifically for these industries: Section 49: "Industrial Inorganic Chemicals"
Synthesis of inorganic materials: Section 78: "Inorganic Chemicals and Reactions"
9. Cermets: Section 56: "Nonferrous Metals and Alloys"
10. Ceramics for prosthetic devices and dental materials: Section 63: "Pharmaceuticals"
11. Diamond preparation when not used for abrasives:
Section 49: "Industrial Inorganic Chemicals"
Section 78: "Inorganic Chemicals and Reactions"

12. Polymeric precursors, when the emphasis is on the polymer preparation and reactions:
Section 40: "Textiles and Fibers"
Section 35: "Chemistry of Synthetic High Polymers"
13. Excluded from coverage in CA:
Formulations giving only mixing directions and physical measurements.

C. Cross-References

1. A.1 - For analysis, Section 79: "Inorganic Analytical Chemistry"
2. A.3 - Section 56: "Nonferrous Metals and Alloys"

D. Subsection Arrangement

0. Reviews
1. Glass (Oxide and Nonoxide Glasses)
 - Glass ceramics (crystallized glass, photosittals)
 - Volcanic glass
 - Quartz glass
 - Fused silica
 - Vitreous silica
 - Fused quartz
 - Silica glass
 - Glass fibers
 - Optical glass fibers
2. Ceramics
 - Technical (fine, advanced, high-performance, engineering, structural, functional, tools)
3. Porcelain
 - Electrical insulators
 - Sanitary ware
4. Glazes and glassy coatings
 - Enamels and Enameling
 - Frits
 - Glazes and Glazing
 - Coating with glassy and glass-ceramic materials on unknown substrates
5. Clays and clay products
 - Refractory clay
 - Pottery
 - Earthenware
 - Majolica
 - Whiteware
 - Tiles
 - China
6. Refractories
 - Thermal insulators
 - Heat-resistant ceramics
 - Bricks
 - Furnace linings
 - Glass-furnace linings
 - Cementitious compositions

7. Abrasives
 - Binders for abrasives
 - Grinding wheels or disks
 - Diamond tools
8. Carbon products
 - Carbon fibers
 - Glassy carbon
 - Graphite for high-temperature use
 - Pyrolytic carbon or graphite
 - Carbon-carbon composites
9. Other

Section 58: Cement, Concrete, and Related Building Materials

A. Coverage in This Section

1. Chemistry, composition, and analysis of portland, calcium aluminate, magnesium oxychloride, pozzolan, slag, Keene's, and other cements, lime, gypsum, and concrete. (See B.1-B.6, C.1)
2. Manufacture and properties of cements. (See B.3, B.4)
3. Setting and hardening, if a chemical phenomenon is involved and described.
4. Resistance to corrosion, weathering, chemicals, and mechanical wear.
5. Other building materials (e.g., modifying agents for soil strengthening, bituminous mixtures for road construction, and structural materials). (See C.2).
6. Equilibrium studies involving cement mixtures.

B. Alternative Placement and Exclusion from Coverage in CA

1. Concrete based solely on polymeric binders: Section 38: "Plastics Fabrication and Uses"
2. Refractory compositions, including cement, mortar, and concrete: Section 57: "Ceramics"
3. Raw materials, natural or synthetic, from which cement, concrete, and building materials may be produced but such end use is incidental: appropriate section for the material, (e.g., Section 37: "Plastics Manufacture and Processing", Section 49: "Industrial Inorganic Chemicals", Section 53: "Mineralogical and Geological Chemistry")
4. Dental cements: Section 63: "Pharmaceuticals"
5. Polymer-based roofing materials: Section 38: "Plastics Fabrication and Uses"
6. Excluded from coverage in CA:
Formulations giving only mixing directions and physical measurements and no chemical information.

C. Cross-References

1. A.1 - For analysis, Section 79: "Inorganic Analytical Chemistry"
2. A.2 - For plastic structural materials, Section 38: "Plastics Fabrication and Uses"

D. Subsection Arrangement

0. Reviews
1. Cements
 - Hydraulic
 - Structural
2. Concretes
3. Other construction components
 - Gypsum
 - Mortar
 - Lime
 - Plaster

4. Finished and semifinished construction materials
 - Gypsum board
 - Prefabricated concrete
 - Paving
 - Roofing
5. Soil strengthening or modification
6. Other

Section 59: Air Pollution and Industrial Hygiene

A. Coverage in This Section

1. Methods for the determination of pollutants in air, including analysis of air pollutants such as airborne dust, fly ash, or flue dust. (See B.1, C.1)
2. Occurrence and composition of air pollution from natural (e.g. radon) or anthropogenic sources (e.g., waste gases, flue gases, etc.). (See B.2, C.2, C.3)
 - a. Smog formation and abatement
 - b. General studies on corrosion or erosion of structural materials by exposure to air pollutants (See B.3)
 - c. Epidemiological studies of effects of air pollution on man (See B.4, B.5, C.3, C.5)
 - d. Indoor and mine air pollution by radon and other natural radioisotopes and radioactive fallout, including health physics studies for detection, dosimetry, monitoring, and remediation of the pollution (See B.6, B.13, C.2)
 - e. Nonspecific environmental pollution (See B.7, B.8)
3. Composition and treatment of automotive and combustion engine exhaust gases after they leave the engine. (See B.9, C.4)
4. Composition and treatment of waste gases, including apparatus for such treatment (e.g. scrubbers, electrostatic precipitators).
5. Industrial hygiene and safety, including safety in storage, transportation, and handling of chemicals as it relates to personnel. (See B.5, B.10, C.5)
6. Ventilation and purification or conditioning of air. (See B.11, B.12)
7. Rules and regulations regarding environmental pollution and air pollution control and discharge standards for atmospheric pollutants. (See B.7, B.8)

B. Alternative Placement and Exclusion from Coverage in CA

1. Analysis of more than one medium:
Section 79: "Inorganic Analytical Chemistry"
Section 80: "Organic Analytical Chemistry"
2. Chemistry of the atmosphere, e.g., troposphere, stratosphere, mesosphere, ionosphere, magnetosphere: Section 53: "Mineralogical and Geological Chemistry"
3. Studies on corrosion or erosion of specific materials by environmental exposure: Appropriate section for the material being studied, (e.g., Section 55: "Ferrous Metals and Alloys", Section 58: "Cement, Concrete, and Related Building Materials", or appropriate macromolecular chemistry section)
4. Dose-controlled studies of the toxicity of air pollutants to man and other biological systems: Section 4: "Toxicology"
5. Methods for the determination of pollutants and toxic substances and their metabolites and of biological indicators of toxicant exposure in organs, tissues, and biological fluids (e.g., urine): Section 4: "Toxicology"
6. Radioactive pollutant effects in biological systems: Section 8: "Radiation Biochemistry"
7. Soil pollution: Section 19: "Fertilizers, Soils, and Plant Nutrition"
8. Water pollution: Section 61: "Water"

9. Exhaust gas pollution control by fuel alteration including additives and blends and engine modification including studies on air-fuel ratio and alteration of firing conditions: for fossil fuels and blends, Section 51: "Fossil Fuels, Derivatives, and Related Products"
For nonfossil fuels, Section 52: "Electrochemical, Radiational, and Thermal Energy Technology"
10. Safety in equipment design: Section 47: "Apparatus and Plant Equipment"
11. Life-support systems and atmosphere regeneration (e.g., in space vehicles or deep-sea diving equipment): Section 9: "Biochemical Methods"
12. Air fresheners: Section 62: "Essential Oils and Cosmetics"
13. Health physics studies dealing with radiation protection of personnel in nuclear industry installations and radiochemical and nuclear chemistry laboratories, including dosimeters and devices for monitoring radiation levels: Section 71: "Nuclear Technology"

C. Cross-References

1. A.1 -
Section 79: "Inorganic Analytical Chemistry"
Section 80: "Organic Analytical Chemistry"
2. A.2 -
Section 71: "Nuclear Technology" for Health Physics and Dosimetry Studies
Section 8: "Radiation Biochemistry" for radioisotope effects on biological systems
3. A.2 - Cross-refer to appropriate section for the industrial source of pollutant.
4. A.3 -
Section 51: "Fossil Fuels, Derivatives, and Related Products" for fossil fuels and blends,
Section 52: "Electrochemical, Radiational, and Thermal Energy Technology" for nonfossil fuels
Section 67: "Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms"
5. A.2 - Section 4: "Toxicology" and to appropriate section for the industry.

D. Subsection Arrangement

0. Reviews
1. Analysis
 - Waste gases
 - Flue gases
 - Exhaust gases
 - Air pollutants
 - Flue dust
 - Airborne dust
 - Fly ash
2. Air pollutants and air pollution
 - Smog
 - Radioactive fallout
 - Radon and natural radioisotope indoor air pollution
 - Corrosion effects
 - General biological effects
 - Unspecified environmental pollution
3. Combustion engine exhaust gas and catalytic converters
 - Gas sensors for pollutant monitoring

4. Industrial waste gases
 - Composition
 - Treatment
 - Apparatus
5. Industrial hygiene
 - Health effects
 - Dosimetry
 - Safety
6. Other
 - Air purification
 - Ventilation

Section 60: Waste Treatment and Disposal

A. Coverage in This Section

1. Analysis, composition determination, treatment, minimization, and disposal of industrial, municipal, agricultural, laboratory or domestic wastes and wastewaters. (See B.1-B.8, B.12, C.1, C.2)
2. Waste treatment systems for homes, motor homes, boats, airplanes, portable toilets and other self-contained units. (See C.1)
3. Design and operation of incinerators and waste combustors, including heat recovery systems. (See B.11)
4. Destruction of toxic chemical wastes. (See B.6, B.7, C.1)
5. Composition, treatment, and disposal of flue dust, fly ash, and other bulk solids and liquids from waste gas treatment. (See B.4)
6. Biodegradability studies related to waste treatment. (See B.8)
7. Waste disposal and chemical manufacture site reclamation and cleanup of chemical spills including in situ decontamination, bioremediation, and Superfund actions. (See B.8-B.10, C.1)
8. Formation, composition, and treatment of leachates from disposal sites and landfills. (See B.10)
9. Rules and regulations regarding waste classification, hazardous waste generator report requirements and standards, and wastewater discharge standards. (See B.1, B.2, B.4, C.1).
10. General studies on recovery of multiple types of materials from wastes for reuse. (See B.1)

B. Alternative Placement and Exclusion from Coverage in CA

1. Recycling and recovery of specific useful materials from wastes: Section appropriate for the recovered material (e.g., recovery of silver from photoprocessing wastewaters): Section 54: "Extractive Metallurgy"
2. Radioactive wastes: Section 71: "Nuclear Technology"
3. Methods for the analysis of wastewater and sewage: Section 61: "Water"
4. Gaseous wastes, including incinerator gases and flue gases and air pollution by waste gases: Section 59: "Air Pollution and Industrial Hygiene"
5. Manufacture of fuels from wastes: Section 52: "Electrochemical, Radiational, and Thermal Energy Technology"
6. Dose controlled studies of toxicity of wastes and waste constituents to man and other biological systems: Section 4: "Toxicology"
7. Methods for the determination of toxic waste constituents and their metabolites and of biological indicators of toxicant exposure in organs, tissues, and biological fluids (e.g. urine): Section 4: "Toxicology"
8. Water pollution and biodegradability studies related to water pollution: Section 61: "Water"
9. Soil contamination studies of agricultural or ecological interest, waste site reclamation by vegetation or by making the soil arable, and soil pollutant biodegradation by native soil bacteria: Section 19: "Fertilizers, Soils, and Plant Nutrition"
10. Decontamination of aquifers and groundwater, including in situ and biological methods: Section 61: "Water"
11. Use of wastes as fuel supplement or in mixtures with fossil fuels: Section 51: "Fossil Fuels, Derivatives, and Related Products"
Use of wastes as fuels alone or in mixtures with nonfossil fuels: Section 52: "Electrochemical, Radiational, and Thermal Energy Technology"
12. Analysis of more than one medium:
Section 79: "Inorganic Analytical Chemistry"
Section 80: "Organic Analytical Chemistry"

C. Cross-References

1. A.1, A.2, A.4, A.7, A.9, A.10 - Cross-refer to the appropriate section for the industry or activity from which the waste derives.
2. A.1 -
Section 79: "Inorganic Analytical Chemistry"
Section 80: "Organic Analytical Chemistry"

D. Subsection Arrangement

0. Reviews
1. Biological treatment of aqueous wastes
 - Activated sludge
 - Anaerobic digestion
 - Trickling filtration
 - Land or soil treatments
2. Chemical treatment of aqueous wastes
 - Wet oxidation
 - Electrolysis
 - Coagulation
3. Physical treatment of aqueous wastes
 - Adsorption
 - Dissolved air flotation
 - Stripping
4. Composition and treatment of nonaqueous wastes
 - Sewage sludge digestion
 - Composting
5. Disposal of untreated and treated wastes
 - Landfilling
 - Incineration
6. Other
 - Composition of wastes
 - Analysis of nonaqueous wastes

Section 61: Water

A. Coverage in This Section

1. Chemical composition and properties of natural waters and seawater. (See B.7, B.10)
2. Water pollution, including oil spills, radioactive fallout, pollution effects on organisms and organisms as pollution indicators. (See B.5, B.6, B.8, C.1)
3. Methods of analysis of natural and potable waters, seawater, and wastewater. (See B.1, C.2)
4. Water purification, disinfection, desalination, fluoridation, and other treatment processes, including recovery of potable and industrial quality waters from wastewater. (See B.2, B.5-B.7)
6. Water treatment chemicals for potable water and cooling water, including additives for corrosion prevention, polymeric flocculants, antifouling agents, scale control agents, etc. (See B.3, B.10)
7. Chemical composition and properties of industrial water, including wastewater treatment to allow reuse into the same process.
8. Mutagenicity and genotoxicity of water disinfection byproducts as indicators of pollution. (See B.5, B.6)
9. Atmospheric precipitation and acid rain. (See B.4)
10. Rules and regulations regarding drinking water standards and water pollution standards. (See B.2)
11. Water resource management and water quality studies.
12. Bacterial regrowth potential in potable water distribution systems. (See B.10)

B. Alternative Placement and Exclusion from Coverage in CA

1. Analysis of more than one medium:
Section 79: "Inorganic Analytical Chemistry"
Section 80: "Organic Analytical Chemistry"
2. Treatment of wastewaters: Section 60: "Waste Treatment and Disposal"
3. Materials oriented studies: Section appropriate for the material affected, (e.g., metal corrosion: Section 55: "Ferrous Metals and Alloys", Section 56: "Nonferrous Metals and Alloys"; concrete: Section 58: "Cement, Concrete, and Related Building Materials")
4. Rainmaking processes: Section 53: "Mineralogical and Geological Chemistry"
5. Dose-controlled studies of the toxicity of water pollutants or constituents to man and other biological systems: Section 4: "Toxicology"
6. Methods for the determination of pollutants and toxic substances and their metabolites and of biological indicators of toxicant exposure in organs, tissues, and biological fluids (e.g. urine): Section 4: "Toxicology"
7. Pesticides in water, when the emphasis is on agrochemical implications (e.g., herbicides used for aquatic weed control): Section 5: "Agrochemical Bioregulators"
8. Radioactive pollutant effects on biological systems: Section 8: "Radiation Biochemistry"
9. Regulations on air pollution: Section 59: "Air Pollution and Industrial Hygiene"
Regulations on waste classification: Section 60: "Waste Treatment and Disposal"

10. Excluded from coverage in CA:
 - a. Bacterial and other organism counts in waters.
 - b. Ecological studies not related to the chemistry of water or pollution, e.g. interrelations of organisms in aquatic ecosystems.
 - c. Effects of water natural components (even if chemical composition is defined) on aquatic organism growth, production, and yield.

C. Cross-References

1. A.2 - If wastewater from a particular industry is the pollutant, Section 60: "Waste Treatment and Disposal" and the appropriate section for the source of the wastewater.
2. A.3 -
Section 79: "Inorganic Analytical Chemistry"
Section 80: "Organic Analytical Chemistry"

D. Subsection Arrangement

0. Reviews
1. Source
 - Chemical oceanography
 - Hydrogeology
 - Chemical limnology
2. Water pollution
 - Wastewater pollution
 - Acidification of natural waters
 - Oil spills
 - Pesticide pollution
 - Pollution bioindicators
3. Analysis
 - Natural waters and seawater
 - Sediments
 - Wastewater
4. Desalination
5. Water purification (including treatment for industrial uses)
 - Reverse osmosis
 - Filtration
 - Disinfection
6. Softening and ion exchange
7. Composition and properties of boiler water and other industrial waters
8. Waterside corrosion, scaling, and biofouling and their prevention
9. Atmospheric precipitation
 - Rain
 - Fog
 - Snow
 - Acid rain
 - Sleet
10. Other

Section 62: Essential Oils and Cosmetics

A. Coverage in This Section

1. Extraction, isolation, separation, and purification of essential oils of cosmetic and perfume interest. (See B.7)
2. Chemical and physical properties of essential oils of cosmetic and perfume interest.
3. Analysis or composition of essential oils of cosmetic and perfume interest. (See B.7)
4. Formulation, use, analysis, properties, and testing of hair and skin preparations, perfumes, colognes, and related products. (See B.1, B.4, B.7, B.8ab)
5. Hair dye compositions or processes, including compositions in which the dye is formed on the hair in situ. (See B.5)
6. Packaging materials for and storage properties of cosmetics (chemical implication). (See B.8a)
7. Formulation and testing of antiperspirants and deodorants, including room deodorants and air fresheners. (See B.8ab)
8. Toxicology and standards for cosmetics, perfumes, etc., and their components. (See C.1)
9. Federal Register announcements pertaining to cosmetics.
10. Formulation and testing of suntanning and suncreening agents. (See B.8a)
11. Formulations of dentifrices and mouthwashes. (See B.8a, C.2)
12. Chemical syntheses of organic or inorganic compounds found in essential oils and cosmetics when the emphasis is on their use. (See B.2, B.5, C.4)

B. Alternative Placement and Exclusion from Coverage in CA

1. Medicinal oils: Section 63: "Pharmaceuticals"
2. Chemical syntheses of organic or inorganic compounds when the emphasis is on the synthesis: Appropriate organic chemistry section or Section 78: "Inorganic Chemicals and Reactions" (See C.3)
3. Composition of terpenoids in plants, where there is no interest in a commercial oil: Section 11: "Plant Biochemistry"
4. Hair and skin preparations for therapeutic use: Section 63: "Pharmaceuticals"
5. Synthesis of dyes when the emphasis is the synthesis: Section 41: "Dyes, Organic Pigments, Fluorescent Brighteners, and Photographic Sensitizers" (See C.3)
6. Analysis of FD&C dyes (approved for food use): Section 17: "Food and Feed Chemistry"
7. Structure-perception studies of perfumes and other odorous substances:
Section 13: "Mammalian Biochemistry" for studies in mammals
Section 12: "Nonmammalian Biochemistry" for studies in nonmammals
8. Excluded from coverage in CA:
 - a. Cosmetic technology (e.g., spray-can design).
 - b. Subjective and clinical evaluation of cosmetics.

C. Cross-References

1. A.8 - Section 4: "Toxicology"
2. A.11 - Section 63: "Pharmaceuticals"
3. B.2, B.5 - Section 62: "Essential Oils and Cosmetics"
4. A.12 - Studies where the emphasis is in essential oils and cosmetics and in which synthetic data are also reported: Cross-refer to appropriate organic chemistry section or Section 78: "Inorganic Chemicals and Reactions"

D. Subsection Arrangement

0. Reviews
1. General
2. Essential oils
 - Analysis
 - Isolation
 - Extraction
 - Separation
 - Composition
3. Hair preparations
 - Hair compositions
 - Hair waving and setting preparations
 - Shampoos
4. Skin preparations
 - Creams and lotions
 - Deodorants
 - Make-up
 - Nail preparations
 - Sunscreens
5. Fragrance preparations
6. Packaging (chemical implication)
7. Dentifrices

Section 63: Pharmaceuticals

A. Coverage in This Section

1. Chemical, physical, and pharmaceutical properties of inorganic or organic compounds of actual or potential commercial use as drugs, when the properties or synthesis relate to drug formulation. (See B.1, C.1)
2. Extraction of plants as a commercial source of drugs, e.g., increasing yields of commercial drugs by improving extraction procedures, selection of higher yielding plant species, and purification or separation procedures of commercial drugs from plants. Oriental and other pharmaceutical natural products (e.g., “Ayurvedic drugs” are included, if the interest is in commercial drug use. (See B.4, B.5, B.13a, C.2)
3. Pharmaceutical manufacturing techniques and equipment. (See B.3)
4. Compounding and formulation techniques, e.g., stabilization, additives, solubilization, palatability enhancement, enteric coatings, sustained-release agents, or skin penetration enhancers.
5. Effects of containers and container-related storage conditions on the composition, properties, effectiveness, or toxicity of biologicals (e.g., blood) and pharmaceuticals. (See B.6)
6. Preparation, biocompatibility, and use of polymers and fibers for prosthetic devices, surgical goods, and dental materials. (See C.4)
7. Preparation of alloys for prosthetic devices, dental materials, and surgical goods. (See C.4)
8. Pharmaceutical aspects (preparation, packaging, etc.) of blood substitutes and plasma expanders. (See B.6)
9. All aspects (including biological effects, therapeutic use, and toxicity/biocompatibility) of life-maintaining devices and prosthetics.
10. Formulation of radiopharmaceuticals and diagnostic agents. (See B.10, B.10, B.11)
11. Vitamin formulations.
12. Formulation or manufacture of emulsions and solutions for parenteral nutrition.
13. Formulation of feed additives for animal diets, when the interest is therapeutic. (See B.7)
14. Formulation of disinfectants.
15. Hair and skin preparations for therapeutic use (e.g., dandruff and acne treatment). (See B.8)
16. Federal Register announcements pertaining to pharmaceuticals.
17. Vaccine production involving chemistry. (See B.13a)
18. Preparation and pharmaceutical properties of salts of pharmaceuticals, drug-carrier conjugates, prodrugs, or drug derivatives. (See B.12)
19. Drug targeting, where the interest is in delivery to a body site. (See B.12)
20. Methods and apparatus for preparing purified blood fractions (usually for transfusion). (See B.6)

B. Alternative Placement and Exclusion from Coverage in CA

1. Chemical syntheses of compounds for actual or potential use as drugs with the emphasis on synthesis: Appropriate organic chemistry section or Section 78: “Inorganic Chemicals and Reactions” (See C.3)
2. Pharmacodynamic, metabolic, molecular structure-biological activity relationships, physicochemical parameter- or quantitative property-biological activity relationships, patents with the emphasis on pharmacological data in the examples, and pharmacological testing of plant constituents: Section 1: “Pharmacology”
3. Preparation of drugs by fermentation, including methodology that uses plant or animal cell cultures: Section 16: “Fermentation and Bioindustrial Chemistry” (See C.3)
4. Extraction or analysis of biologically active natural products not for use as drugs: Appropriate biochemical section.
5. Isolation of plant constituents, such as alkaloids or terpenes, with no commercial drug use: Section 11: “Plant Biochemistry”

6. Physiological aspects of blood, blood storage, and preservation: Section 13: "Mammalian Biochemistry"
7. Use of food additives for animal diets when the interest is in animal growth or production: Section 18: "Animal Nutrition"
8. Antiperspirants, deodorants and hair and skin formulations for cosmetic use: Section 62: "Essential Oils and Cosmetics"
9. Dentifrices and mouthwashes: Section 62: "Essential Oils and Cosmetics" (See C.3)
10. Chemical syntheses of radiopharmaceuticals when the emphasis is on the synthesis:
Section 71: "Nuclear Technology" if nuclear reactions are emphasized
Appropriate organic chemistry section or Section 78: "Inorganic Chemicals and Reactions" for others.
(See C.3)
11. Metabolism, pharmacology, or toxicity of imaging or scintigraphic agents (radiation-emitting substances):
Section 8: "Radiation Biochemistry" (See C.3)
12. Pharmacology and mechanism of action of prodrugs, drug derivatives, or targeted drug-carrier conjugates: Section 1: "Pharmacology"
13. Excluded from coverage in CA:
 - a. Formulation of crude plant extracts, vaccines, antibodies, antigens or animal serums which are not purified or chemically characterized.
 - b. Pharmacy practice and economics.

C. Cross-References

1. A.1 - Studies where the emphasis is drug formulation and in which synthetic data are also reported: Cross-refer to appropriate organic chemistry section or
Section 78: "Inorganic Chemicals and Reactions"
Section 22: "Physical Organic Chemistry" for physical organic aspects such as kinetics
2. A.2 - Section 11: "Plant Biochemistry"
3. B.1, B.3, B.9-11 - Section 63: "Pharmaceuticals"
4. A.6, A.7 - Studies which include the synthesis of polymers, fibers, and alloys: Cross-refer to appropriate section for the material synthesized.

D. Subsection Arrangement

0. Reviews
1. General
2. Drug standards
 - Pharmacopeias
 - Standardization of drugs and drug preparations
 - FDA recommendations
 - Federal Register announcements
3. Biologicals
 - Vaccines
 - Blood
 - Blood-related products

4. Pharmacognostic products
 - Plant drugs
 - Isolation and purification
5. Pharmaceutics
 - Stability
 - Solubilization and solubility
 - Bioavailability in relation to formulation
 - Physicochemistry of drugs and dosage forms
6. Formulation and compounding
 - Tablets
 - Injections
 - Ointments
 - Solutions
 - Suspensions
 - Suppositories
 - Other delivery systems
7. Prosthetics and medical goods
 - Surgical implants and materials
 - Dental prosthetics and alloys
 - Bandages
 - Sutures
 - Artificial organs
 - Sanitary protection
8. Other
 - Packaging
 - Apparatus
 - Sterilization

Section 64: Pharmaceutical Analysis

A. Coverage in This Section

1. Pharmacopeial methods.
2. Analysis of drugs in pure form as well as in tablets, ampuls, and other pharmaceutical preparations (not in biological system). (See B.1, B.2, B.3)

B. Alternative Placement and Exclusion from Coverage in CA

1. Forensic analysis: Section 4: "Toxicology"
2. Analysis of drugs in tissues, organs, and body fluids: Section 1: "Pharmacology"
3. Analysis of FD&C dyes (approved for food use): Section 17: "Food and Feed Chemistry"

C. Cross-References

None

D. Subsection Arrangement

0. Reviews
1. General
 - Pharmacopeias
 - Federal Government actions
2. Natural drug materials
 - Alkaloids
 - Antibiotics
 - Glycosides
 - Steroids
 - Vitamins
3. Synthetic organic compounds
4. Inorganic compounds

Section 65: General Physical Chemistry

A. Coverage in This Section

1. General theoretical studies related to chemistry or chemical physics in classical, quantum, and statistical mechanics:
 - general kinetic theory, stochastic phenomena;
 - quantum chemistry, density-functional theory;
 - crystal-field theory, lattice gas and related models, fractal geometry.Algorithms, computer programs, and simulation models that pertain to such studies.
(See B.1-B.7, B.26, B.27)
2. Quantum phenomena (e.g., superfluidity) in fluids and solids (^3He , ^4He , spin-polarized atomic H). (See B.6, B.27)
3. Electronic structure, configuration and correlation:
 - energy levels (including band structures, Fermi levels, Brillouin zones);
 - wave functions, atomic and molecular orbitals and integrals.Potentials, screening, electric field gradients at atomic nuclei.
Elementary excitations.
Neutron scattering in study of electronic structure, energy levels, etc.
(See B.1-B.3, B.5, B.6, B.18, B.20, B.27)
4. Interactions (scattering, collisions) of particle beams (atomic, molecular, ionic, electron, positron, etc.) in other than nuclear reactions:
 - electron capture and exchange, impact (including Penning) ionization;
 - energy transfer, excitation and relaxation;
 - reactive collisions.Particle trapping.
(See B.8-B.12, B.27)
5. Atomic and molecular properties:
 - electron affinity, ionization potential;
 - potential energy, interatomic and intermolecular forces;
 - bonding, molecular association, hydrogen bonding;
 - atomic and molecular clusters;
 - molecular structure (if no more suitable section is appropriate);
 - molecular motions (vibration, rotation, oscillator strength, force constants).(See B.1-B.3, B.13, B.20, B.22, B.23)
6. Physicochemical collective properties of pure substances (unary systems):
 - evaporation, condensation, melting, sublimation;
 - melting, boiling, and freezing points;
 - vapor pressure, equations of state, virial coefficients, compressibility;
 - critical states.Generalized transport properties (including diffusion and electrodiffusion, viscosity of pure substances, mixtures, and solutions). Ultrasonic propagation.
(See B.1-B.4, B.6, B.14-B.17, B.21, B.25)
7. Structure studies of fluids and amorphous solids (including glasses) as states of matter (distribution and correlation functions, structure factors).
(See B.3, B.13, B.19, B.22, B.24, C.1)
8. International standards of units and fundamental physical constants.
Nomenclature and terminology related to physical chemistry and chemical physics. (See B.26, B.27)

B. Alternative Placement and Exclusion from Coverage in CA

1. Physicochemical studies primarily concerned with biochemistry and biological systems: Appropriate biochemical section.
2. Physicochemical studies of reactivity, structure-property relationships, etc. with emphasis on organic compounds: Section 22: "Physical Organic Chemistry"
3. Physicochemical studies primarily concerned with macromolecular chemistry: Section 36: "Physical Properties of Synthetic High Polymers" or other appropriate macromolecular chemistry section.
4. Physicochemical studies primarily concerned with applied chemistry or chemical engineering: Appropriate applied chemistry or engineering section.
5. Quantum mechanics, statistics, other theoretical studies explicitly applied to spectroscopy and optical properties; energy levels, excitations, molecular motions, force constants, and oscillator strengths explicitly related to spectroscopic studies: Section 73: "Optical, Electron, and Mass Spectroscopy and Other Related Properties"
6. Theoretical studies, quantum phenomena, etc. as related to subjects more appropriate to other physical sections: Section appropriate for the study (e.g., Section 76: "Electric Phenomena", Section 77: "Magnetic Phenomena", etc.)
7. Statistical thermodynamics, thermochemistry, thermal properties, temperature scales: Section 69: "Thermodynamics, Thermochemistry, and Thermal Properties"
8. Reactive collisions with emphasis on kinetics and mechanism: Section 67: "Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms"
9. Beam-induced nuclear reactions; positron-annihilation studies (unless concerned with electronic structures, Fermi surfaces, etc.): Section 70: "Nuclear Phenomena"
10. Range-energy relations and stopping power in channeling of atomic or charged particle beams:
Section 71: "Nuclear Technology"
Section 75: "Crystallography and Liquid Crystals"
depending on emphasis.
11. Impact ionization, carrier diffusion in conduction, discharge, and plasma studies: Section 76: "Electric Phenomena"
12. Beam studies with primary emphasis on secondary effects (e.g., secondary emission, cathodoluminescence, radiochemistry, radiation damage):
Section 71: "Nuclear Technology"
Section 73: "Optical, Electron, and Mass Spectroscopy and Other Related Properties"
Section 74: "Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes"
Section 75: "Crystallography and Liquid Crystals"
Section 76: "Electric Phenomena"
13. Equilibria; physicochemical studies of solutions (including solution structure, hydrogen bonding in solution, and structure-related property studies); transport properties of solutions (other than diffusion and viscosity, unless structure-related): Section 68: "Phase Equilibria, Chemical Equilibria, and Solutions"
14. Thermal transport properties (thermal conductivity and diffusivity, heat transfer):
Section 69: "Thermodynamics, Thermochemistry, and Thermal Properties"
Section 48: "Unit Operations and Processes"

15. Mass transfer (other than diffusion and electrodiffusion); fluid flow as an industrial unit operation:
Section 48: "Unit Operations and Processes" or other appropriate industrially oriented section.
Osmosis and electrokinetic phenomena (electrophoresis, electroosmosis):
Section 66: "Surface Chemistry and Colloids" or section appropriate for the substance being studied.
Diffusion and electrodiffusion in electrochemical systems or for doping of electrical materials:
Section 52: "Electrochemical, Radiational, and Thermal Energy Technology"
Section 72: "Electrochemistry"
Section 76: "Electric Phenomena"
16. Flow correlated with electrohydrodynamics or magnetohydrodynamics:
Section 52: "Electrochemical, Radiational, and Thermal Energy Technology"
Section 71: "Nuclear Technology"
Section 76: "Electric Phenomena"
Section 77: "Magnetic Phenomena"
as appropriate (or excluded from coverage in CA; See B.27).
17. Electric transport properties (other than electrodiffusion, except when involved in doping of electrical materials or in carrier studies):
Section 72: "Electrochemistry"
Section 76: "Electric Phenomena"
18. Polarizability and electric moments (unless explicitly related to electronic structure): Section 76: "Electric Phenomena"
19. Surface, interfacial and colloidal properties (other than surface and interfacial states): Section 66: "Surface Chemistry and Colloids"
20. Lattice dynamics and energetics; mechanical properties of crystals; bonding where emphasis is on crystal structure: Section 75: "Crystallography and Liquid Crystals"
21. Physicochemical properties applied to chemical analysis and separations: Section appropriate for analytical chemistry or for means of separation or substances being separated (e.g., Section 48: "Unit Operations and Processes" for separation as a chemical engineering process; Section 71: "Nuclear Technology" for isotope separation).
22. Molecular structures of organic compounds and natural products: Appropriate organic or biochemical section.
23. Molecular structures of inorganic compounds where emphasis is on synthesis or reactions: Section 78: "Inorganic Chemicals and Reactions"
24. Glass structure when related to composition, processing, and/or applications:
Section 57: "Ceramics"
or for metallic glasses,
Section 55: "Ferrous Metals and Alloys"
Section 56: "Nonferrous Metals and Alloys"
25. Ultrasound as a tool in, e.g., solution-structure or solid-phase transition studies:
Section 68: "Phase Equilibria, Chemical Equilibria, and Solutions"
Section 75: "Crystallography and Liquid Crystals"
or other section appropriate for the study.
26. Data processing and computer applications not related to the subject matter appropriate for this section: Section 20: "History, Education, and Documentation" or other section appropriate for the study.
27. Excluded from coverage in CA:
 - a. Mathematics and mathematical and theoretical physics with no explicit interest to chemistry or chemical physics.
 - b. Experimental physics (e.g., hydrodynamics, propagation of sonic or shock waves) with no explicit interest to chemistry.

C. Cross-References

1. A.7 - For glass structure, Section 57: "Ceramics"

D. Subsection Arrangement

0. Reviews
1. General theories
 - Physicochemical
 - Mathematical, statistical
 - Quantum
2. Quantum liquids and solids
3. Electronic structure
 - Energy levels
 - Band structures
 - Wave functions, orbitals
4. Scattering and collision processes; particle trapping
5. Atomic and molecular properties
6. Macroscopic properties
7. Structures and structure-related properties of fluids and amorphous solids
8. Other
 - Standards
 - Units, constants
 - Nomenclature, terminology

Section 66: Surface Chemistry and Colloids

A. Coverage in This Section

1. Physical chemistry of surfaces and interfaces (liquid-gas, liquid-liquid, solid-gas, solid-liquid and solid-solid) and two-dimensional phases; surface and interfacial tension, pressure, energy, and structure. (See B.1-B.5, B.8, B.13, B.14, B.21)
2. Surface analysis (other than the chemical analyses of surfaces and interfaces). (See B.3, B.17, B.21)
3. Colloidal and other disperse systems:
 - suspensions;
 - emulsions, sols, gels, micellar systems;
 - aerosols, aerogels, foams, smokes, fogs.(See B.6-B.8)
4. Sorption processes:
 - adsorption and chemisorption;
 - absorption (not regarded as a dissolution process);
 - desorption.General studies on chromatography (including properties of new or improved chromatographic adsorbents without explicit stated use) not associated with chemical analysis or separations of particular substances. (See B.9-B.16)
5. Sorbed substances and other surface species:
 - sorbates, monolayers, supported (e.g., Langmuir-Blodgett) films;
 - oxidized, grafted, and other modified surfaces.(See B.3, B.13, B.14)
6. Electrokinetic phenomena:
 - electrophoresis and electroosmosis;
 - streaming and sedimentation potentials, zeta potential.Electrodialysis.
(See B.15, B.21)
7. General studies on ion exchange. (See B.18, B.19)
8. Artificial membranes and permeation studies (without major emphasis on biochemical systems or means of separation). (See B.15, B.19, B.20)

B. Alternative Placement and Exclusion from Coverage in CA

1. Chemical reactions of surfaces (other than chemisorption) and surface-catalyzed reactions:
 - Section 67: "Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms"
 - Section 78: "Inorganic Chemicals and Reactions"or other section appropriate for the type of reaction and/or substance studied.
2. Surface properties of catalysts, when catalytic nature is stressed: Section 67: "Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms" or section appropriate for the particular reaction under study.
3. Surface properties of polymers with emphasis on polymeric nature; surface modification by graft polymerization: Appropriate macromolecular chemistry section.
4. Surface and interfacial energy levels (surface states):
 - Section 65: "General Physical Chemistry"
 - Section 76: "Electric Phenomena"

5. Surface and interfacial studies with emphasis on electrical materials and devices:
Section 52: "Electrochemical, Radiational, and Thermal Energy Technology"
Section 76: "Electric Phenomena"
6. Colloids and aerosol sprays for cosmetics, foods, paints, pesticides, etc.: Appropriate use-oriented section.
7. Atmospheric dispersions (dust, fog, aerosols, etc.):
Section 53: "Mineralogical and Geological Chemistry"
Section 59: "Air Pollution and Industrial Hygiene"
Section 61: "Water"
8. Soaps, detergents, and surfactants with emphasis on their compositions and/or uses for the purposes of cleaning, emulsifying, foaming, etc.: Section 46: "Surface-Active Agents and Detergents"
9. Absorption of gases by liquids:
Section 48: "Unit Operations and Processes" if chemical engineering is stressed
Section 67: "Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms" if reaction mechanism or kinetics is stressed
Section 68: "Phase Equilibria, Chemical Equilibria, and Solutions" if dissolution is stressed
10. Adsorption and chemisorption on electrodes with emphasis on electrochemical aspects: Section 72: "Electrochemistry"
11. Thermochemistry of sorption processes: Section 69: "Thermodynamics, Thermochemistry, and Thermal Properties"
12. Absorbents and adsorbents for commercial use: Appropriate use-oriented section.
13. Coating processes and coatings for decorative, protective or finishing purposes, and film deposition and properties more appropriate to other sections:
Section 42: "Coatings, Inks, and Related Products"
Section 72: "Electrochemistry"
Section 74: "Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes"
Section 76: "Electric Phenomena"
or other section appropriate for the study.
14. Epitaxy; film deposition without explicit surface interest: Section 75: "Crystallography and Liquid Crystals" or section appropriate for the application.
15. Separation by chromatography, dialysis, electrophoresis, and electroosmosis:
Section 9: "Biochemical Methods" or other appropriate biochemistry section if the emphasis is biochemical
Section 48: "Unit Operations and Processes" or appropriate applied chemistry section if the emphasis is engineering or industrial
Appropriate analytical chemistry section if the emphasis is analytical
16. Preparative chromatography: Section appropriate for the product studied.
17. Chemical analysis of surfaces and colloids: Appropriate analytical chemistry section.
18. Ion exchange and exchangers with emphasis on application: Section appropriate for the application (e.g., for extractive metallurgy, Section 54: "Extractive Metallurgy"; for waste treatment, Section 60: "Waste Treatment and Disposal"; for water treatment, Section 61: "Water").
19. Ion exchange resins and polymeric membranes with emphasis on the polymeric nature:
Section 37: "Plastics Manufacture and Processing"
Section 38: "Plastics Fabrication and Uses"

20. Membranes with emphasis on biochemical aspects: Appropriate biochemistry section.
21. Excluded from coverage in CA:
 - a. Electrokinetic potentials not related to colloidal phenomena, chemical composition, or surface chemistry.
 - b. Surface and interfacial studies with no interest to chemistry or chemical engineering.

C. Cross-References

None

D. Subsection Arrangement

0. Reviews
1. Liquid-gas systems
 - Surface tension, energy, and pressure
 - Foams
 - Fogs
 - Aerosols from liquids and gases
 - Films on liquid subphases
2. Liquid-liquid systems
 - Interfacial tension, energy, and pressure
 - Emulsions (without solid phase)
 - Micelles
 - Films between liquid interfaces
 - Liquid membranes, vesicles, liquid bilayers
3. Solid-gas systems
 - Adsorption
 - Films from gases on solids
 - Aerosols from solids and gases
 - Aerogels
 - Smokes
4. Solid-liquid systems
 - Gels
 - Sols
 - Dispersed solids in liquids (suspensions)
 - Emulsified solids
 - Electrokinetic (zeta) potential
 - Electrophoresis, electroosmosis and dialysis
 - Electric double layer
 - Ion exchange
 - Colloidal properties of clay minerals and adsorbents
 - Solid membranes in liquid systems
5. Solid-solid systems
 - Interfaces
 - Adsorbed solids and solid films on solids
6. Other

Section 67: Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms

A. Coverage in This Section

1. General homogeneous and heterogeneous catalytic reactions. (See B.1-B.10, C.1)
2. Preparation and properties of catalysts for inorganic reactions and for those organic reactions for which the interest and emphasis is on the catalysts, the organic reactions being used primarily to characterize the catalysts. (See B.2-B.4, B.7-B.11, C.1)
3. Principles of reaction kinetics, and the reaction rates and mechanisms for reactions of inorganic and coordination compounds. (See B.1-B.5, B.7-B.10)
4. Principles of kinetic isotope, substituent, and solvent effects; and such effects as they apply to reactions of inorganic and coordination compounds. (See B.1-B.4, B.7-B.10)
5. Methods and apparatus for the study of reaction mechanisms and kinetics.

B. Alternative Placement and Exclusion from Coverage in CA

1. Specific catalytic reactions with emphasis on the products rather than on the catalysts: Section appropriate for the particular product studied.
2. Catalysis and catalysts in biological systems: Appropriate biochemistry section.
3. Catalysis, kinetics, and mechanisms of organic reactions:
(e.g., Section 22: "Physical Organic Chemistry" or other organic chemistry section appropriate for such studies or Section 29: "Organometallic and Organometalloidal Compounds").
4. Polymerization and polymerization catalysts:
Section 35: "Chemistry of Synthetic High Polymers"
Section 39: "Synthetic Elastomers and Natural Rubber"
5. Catalytic reactions involving fossil fuels and their derivatives (including petroleum refining): Section 51: "Fossil Fuels, Derivatives, and Related Products"
6. Catalytic reaction of carbon monoxide with hydrogen with emphasis on the products:
Section 45: "Industrial Organic Chemicals, Leather, Fats, and Waxes"
Section 51: "Fossil Fuels, Derivatives, and Related Products"
7. Catalysts for and catalysis in control of air pollution: Section 59: "Air Pollution and Industrial Hygiene"
8. Electrochemical reactions and electrocatalysts: Section 72: "Electrochemistry"
9. Photochemical reactions and photocatalysts: Section 74: "Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes"
10. Catalysis and kinetics in chemical analysis: Appropriate analytical section.
11. Patents on catalysts for preparation of industrial organic chemicals: Section 45: "Industrial Organic Chemicals, Leather, Fats, and Waxes"

C. Cross-References

1. A.1, A.2 - If an organic reaction is involved, cross-refer to appropriate organic section.

D. Subsection Arrangement

0. Reviews
1. Catalysts
2. Catalytic reactions
3. Reaction kinetics
 - Rate
 - Mechanism and reaction order
 - Isotope, substituent and solvent effects
4. Methods and apparatus
5. Other

Section 68: Phase Equilibriums, Chemical Equilibriums and Solutions

A. Coverage in This Section

1. Phase studies of multicomponent organic, inorganic, and metallic systems:
phase rule and equilibriums, liquidus, solidus, and vaporization curves;
critical and triple points;
solid solutions, eutectics, solvates;
phase stability and metastability (including glassy phases);
phase separation, spinodal decomposition.
(See B.1-B.9)
2. Dissolution (including absorption from the standpoint of a solution process) and solubility. (See B.2-B.6, B.15)
3. Partition and extraction studies with emphasis on mechanism or nonindustrial separations. (See B.10-B.13)
4. Chemical equilibriums in organic and inorganic systems in gaseous, liquid, and solid states:
reaction equilibriums and equilibrium constants;
complex formation and stability constants;
vapor transport equilibriums;
acidity functions, acid dissociation constants.
(See B.1-B.6, B.10, B.12-B.18)
5. Solution properties and structure of aqueous and nonaqueous, electrolytic and nonelectrolytic, metallic, and fused salt solutions:
activity;
ion association, hydrogen bonding;
solvation.
(See B.1-B.7, B.13, B.14, B.16-B.19)

B. Alternative Placement and Exclusion from Coverage in CA

1. Unary systems (including physicochemical properties of pure substances); liquid structure theory, unless solution nature is emphasized; structure of vitreous (glassy) systems; ion solvation in gas phase; diffusion in solutions and solution viscosity; theoretical studies in which the solution state is only incidental: Section 65: "General Physical Chemistry"
2. Phase and solution studies on polymers: Section 36: "Physical Properties of Synthetic High Polymers"
3. Equilibriums in and solution properties of geochemical systems: Section 53: "Mineralogical and Geological Chemistry"
4. Alloy systems (metallic solutions) with emphasis on metallurgical properties:
Section 55: "Ferrous Metals and Alloys"
Section 56: "Nonferrous Metals and Alloys"
5. Glass, glass-ceramic, ceramic, and cement systems with emphasis on processing and applications:
Section 57: "Ceramics"
Section 58: "Cement, Concrete, and Related Building Materials"
6. Colloidal systems; ion exchange; surface and interfacial properties of solutions; chromatographic theory: Section 66: "Surface Chemistry and Colloids"
7. Solid solutions with primary emphasis on crystal structure and crystallographic phase transitions; liquid crystals; methodology of structure studies: Section 75: "Crystallography and Liquid Crystals"
8. Phase studies with primary emphasis on electric properties (e.g., conductivity transitions, ferroelectricity); electrolytic conductivity studies not explicitly related to solution theory or structure: Section 76: "Electric Phenomena"

9. Phase studies with primary emphasis on magnetic (spin) structure: Section 77: "Magnetic Phenomena"
10. Extractive and chromatographic separations of primarily biochemical interest: Section 9: "Biochemical Methods" or other appropriate biochemistry section.
11. Ion exchange and extractive and chromatographic separations of primarily industrial interest:
Section 48: "Unit Operations and Processes"
Section 54: "Extractive Metallurgy"
Section 71: "Nuclear Technology"
or other section appropriate for the study.
12. Analytical methods, including separations, based on equilibria (e.g., chromatography, extraction):
Appropriate analytical chemistry section.
13. Isotope separation: Section 71: "Nuclear Technology"
14. Acid-base and hydrogen-bonding studies of organic compounds with emphasis on structure-property relations:
Section 22: "Physical Organic Chemistry"
15. Biochemical equilibria (acid-base, complex formation); dissolution of inorganic salts in biochemical systems:
Appropriate biochemistry section.
16. Equilibria with emphasis on reaction kinetics and mechanism:
Section 22: "Physical Organic Chemistry"
Section 35: "Chemistry of Synthetic High Polymers"
Section 67: "Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms"
or other section appropriate for the particular reaction under study.
17. Equilibria related to petroleum recovery and refining, coal gasification, etc.: Section 51: "Fossil Fuels, Derivatives, and Related Products"
18. Coordination compounds in solution with emphasis on molecular structure: Section 78: "Inorganic Chemicals and Reactions"
19. Solid and fused salt electrolytes with emphasis on electrical properties or applications:
Section 52: "Electrochemical, Radiational, and Thermal Energy Technology"
Section 72: "Electrochemistry"
Section 76: "Electric Phenomena"

C. Cross-References

None

D. Subsection Arrangement

0. Reviews
1. Phase equilibria, solubility
2. Partition, extraction
3. Acid-base equilibria, complex formation
4. Other chemical equilibria (without mechanistic or kinetic interest)
5. Nonelectrolytic solutions
6. Electrolytic solutions
7. Metallic solutions
8. Fused salts
9. Other

Section 69: Thermodynamics, Thermochemistry, and Thermal Properties

A. Coverage in This Section

1. Fundamental principles of thermodynamics and energetics, including statistical and irreversible thermodynamics, as applied to chemical systems.
(See B.1, B.2, B.18)
2. Thermochemical properties:
heat capacities and specific heats;
enthalpies, entropies, free energies, and partial molar (molal) functions;
thermochemistry of reactions and other physicochemical processes.
(See B.1, B.2, B.7-B.12)
3. Temperature and thermal properties:
temperature scales, thermometry, pyrometry;
thermal conductivity and diffusivity;
thermal expansion, Joule-Thomson effect.
(See B.2-B.6, B.9-B.12, B.16-B.18)
4. Methods and apparatus related to calorimetry, thermal analysis (differential, thermogravimetric, etc.), cryogenics, heat detection, etc. (See B.13-B.18)

B. Alternative Placement and Exclusion from Coverage in CA

1. Kinetic activation parameters (activation energies, free energies and entropies of activation):
For reactions
Section 22: "Physical Organic Chemistry"
Section 35: "Chemistry of Synthetic High Polymers"
Section 67: "Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms"
or other section appropriate for the reaction studied.
For nonreactive processes, section appropriate for the process studied.
2. Energetics of and thermal effects on biological systems: Appropriate biochemistry section.
3. Heat transfer in engineering and industrial processes:
Section 48: "Unit Operations and Processes"
Section 71: "Nuclear Technology"
or other section appropriate for the specific process.
4. Mass transfer resulting from thermal gradients (e.g., thermal diffusion, transpiration):
Section 65: "General Physical Chemistry"
Section 48: "Unit Operations and Processes"
depending on emphasis.
5. Technology of energy sources and the conversion, handling, transport, and storage of thermal energy: Section 52: "Electrochemical, Radiational, and Thermal Energy Technology"
6. Thermal expansion of crystals when related to lattice parameters; Debye, Einstein and other characteristic temperatures related to lattice dynamics: Section 75: "Crystallography and Liquid Crystals"
7. Thermodynamics of colloidal systems: Section 66: "Surface Chemistry and Colloids"
8. Thermochemistry of polymerization; thermodynamic and thermal properties of synthetic polymers and plastics: Appropriate macromolecular section.
9. Thermal properties of fossil fuels: Section 51: "Fossil Fuels, Derivatives, and Related Products"
10. Thermoelectricity and thermionic emission: Section 76: "Electric Phenomena"
11. Thermomagnetism: Section 77: "Magnetic Phenomena"

12. Thermographic copying and thermal printing: Section 74: "Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes"
13. Thermal analysis, thermogravimetry, etc. as a means to study a particular process: Section appropriate for the process (e.g., for the decomposition of inorganic compounds, Section 78: "Inorganic Chemicals and Reactions").
14. Infrared detectors: Section 73: "Optical, Electron, and Mass Spectroscopy and Other Related Properties"
15. Thermometric devices, temperature controllers, refrigeration and cryogenic apparatus, temperature baths, furnaces, kilns, etc. intended for industrial use: Section 47: "Apparatus and Plant Equipment" or section appropriate for the application.
16. Methods and apparatus applied to analytical chemistry: Appropriate analytical chemistry section.
17. Methods and apparatus relating to nuclear reactors: Section 71: "Nuclear Technology"
18. Excluded from coverage in CA:
Thermodynamics, heat transfer, heat detection, etc., without application to chemical systems.

C. Cross-References

None

D. Subsection Arrangement

0. Reviews
1. Thermodynamic theory
2. Thermochemical properties
3. Calorimetry, thermal analysis, thermogravimetry
4. Temperature, thermometry, heat detection, cryogenics
5. Thermal properties
6. Other

Section 70: Nuclear Phenomena

A. Coverage in This Section

1. Nuclear and subnuclear reactions and properties: decay, fission, fusion, annihilation, pair production; structure. (See B.1, B.2, B.4-B.9)
2. Elementary and subelementary particles and their properties, structures, and interactions. (See B.1, B.7)
3. Exotic atoms, molecules, and nuclei (in which an elementary or subelementary particle replaces the usual constituent particle; e.g., pionic and quark atoms, hypernuclei). Other unusual species involving elementary and subelementary particles (e.g., positronium, muonium). (See B.1)
4. Interactions between nuclear phenomena and chemical systems. Chemical reactions and properties of atoms and ions in highly excited states or with high kinetic energies because of nuclear processes. Labeling of compounds by nuclear reactions. (See B.1, B.2, B.4-6, B.8, B.9)
5. Cosmic rays, nucleosynthesis in nature, and cosmology. (See B.3)

B. Alternative Placement and Exclusion from Coverage in CA

1. Particle studies without emphasis on nuclear aspects (e.g., organic muonium compounds; atomic and molecular excitation by particle beams; neutrons and positrons in crystallographic and magnetic studies; muon spin resonance): section appropriate to the study (e.g., Section 22: "Physical Organic Chemistry", Section 65: "General Physical Chemistry", Section 75: "Crystallography and Liquid Crystals", Section 77: "Magnetic Phenomena").
2. Labeling of compounds by exchange reactions or by chemical synthesis with tracers: Appropriate organic, inorganic, or biochemical preparative section.
3. Solar radiation as it pertains to power generation: Section 52: "Electrochemical, Radiational, and Thermal Energy Technology"
4. Preparation, separation, handling, packaging, transportation, storage, and nuclear and radiochemical applications of isotopes:
Section 71: "Nuclear Technology"
Section 8: "Radiation Biochemistry" for biological effects
5. Absorption, interactions, and scattering of elementary particles, heavy ions, or radiation in bulk matter (as distinct from scattering by specific nuclei):
Section 71: "Nuclear Technology"
Section 8: "Radiation Biochemistry" for biological effects
6. Radiation damage: Section 71: "Nuclear Technology" or section appropriate for the material under study.
7. Applications of nuclear fusion and fission: Section 71: "Nuclear Technology"
8. Patents related to nuclear science: Section 71: "Nuclear Technology"
9. Activation analysis: Appropriate analytical chemistry section.

C. Cross-References

None

D. Subsection Arrangement

0. Reviews
1. Experimental and theoretical studies of nuclear decay, structure, properties, and reactions (including fusion, fission, and nucleon scattering and interactions)
2. Hyperfragments and hypernuclei
3. Experimental and theoretical studies on nucleon resonances, mesons, hyperons, hadrons, and baryons
4. Leptons, electrons (beta particles), positrons, neutrinos, and muons
5. Exotic atoms and molecules; positronium and mesonic atoms
6. Hot-atom chemistry
7. Cosmic rays and cosmology
8. Other

Section 71: Nuclear Technology

A. Coverage in This Section

1. Acceleration of elementary particles and high-energy ions and neutral particles. Particle accelerators and associated apparatus.
2. Interactions (absorption, scattering) of high-energy particulate (elementary particles, ions) and electromagnetic radiation in bulk matter (as distinct from interactions with specific nuclei). Radiation effects on and damage to materials and systems of interest to nuclear technology.
(See B.1, B.2, B.8)
3. Radiation sources for studies appropriate for this section.
(See B.2, B.3)
4. Nuclear fusion reactors:
 - characteristics and operation;
 - materials;
 - properties, reactions, and containment of thermonuclear plasmas.
(See B.5, B.12)
5. Nuclear fission reactors:
 - characteristics and operation (criticality calculations, neutron energy distribution, etc.);
 - preparation, properties, reactions, and chemical processing of nuclear fuels and fuel elements;
 - chemical reprocessing of irradiated fuels;
 - nuclear poisons;
 - reactor materials and parts (control rods, moderators, coolants, heat-transfer systems).
(See B.12)
6. Isotopes:
 - preparation and separation;
 - handling, packaging, transportation, and storage;
 - nuclear and radiochemical applications.
(See B.7-B.11)
7. Detection, counting, and dosimetry.
 - Radiation detectors and counters:
 - cloud and ionization chambers;
 - dosimeters;
 - multichannel analyzers;
 - nuclear emulsions.
 - Autoradiography. Spectrometry of and spectrometers for nuclear and subnuclear particles and high-energy electromagnetic radiation.
(See B.4)
8. Contamination and decontamination involving radioactive materials. Safety and health physics studies dealing with shielding against and monitoring of radioactive materials; health hazards associated with the handling of or exposure to such materials.
(See B.9, B.10)
9. Radioactive wastes: treatment, storage, and disposal.
10. Chemical technology of the design and development of nuclear batteries and other nuclear auxiliary power systems, nuclear propulsion and nuclear explosive devices; nuclear explosions. (See B.12)

B. Alternative Placement and Exclusion from Coverage in CA

1. Interactions of elementary particles, ions, and electromagnetic radiation with particular nuclei: Section 70: “Nuclear Phenomena”
2. Interactions of radiation with atoms, molecules, and charged particles without nuclear considerations (e.g., scattering, channeling, damage, luminescence, secondary emission, analysis, diffractometry, microscopy); particle sources, accelerators, detectors, spectrometers for such studies: Section appropriate to the study.
3. Electron and ion sources not intended for nuclear applications:
Section 76: “Electric Phenomena”
Section 73: “Optical, Electron, and Mass Spectroscopy and Other Related Properties” if associated with spectrometry,
4. X-ray and Moessbauer spectrometry and spectrometers: Section 73: “Optical, Electron, and Mass Spectroscopy and Other Related Properties”
5. Nuclear fusion reactions not studied for the purpose of development of fusion reactor fuels and plasmas: Section 70: “Nuclear Phenomena”
6. Plasma studies without fusion (thermonuclear) considerations: Section 76: “Electric Phenomena” or other section appropriate for the study (e.g., for spectroscopic studies Section 73: “Optical, Electron, and Mass Spectroscopy and Other Related Properties”).
7. Chemical analysis and analytical separation of isotopes; activation analysis: Appropriate analytical chemistry section.
8. Radiation chemistry without nuclear considerations: Section 74: “Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes” or other section appropriate for the study.
9. Radon indoor air pollution and radioactive fallout from the viewpoint of air pollution:
Section 59: “Air Pollution and Industrial Hygiene”
Section 8: “Radiation Biochemistry” if biological systems are involved
10. Radiation effects and applications in biochemistry: Section 8: “Radiation Biochemistry”
11. Radiopharmaceuticals, unless emphasis is on nuclear reactions in preparation: Section 63: “Pharmaceuticals”
12. Excluded from coverage in CA:
 - a. Mechanical and engineering aspects of equipment design other than intended for improved accelerator, reactor, or detector operation.
 - b. Electronic circuitry, data acquisition systems, and communication links.

C. Cross-References

None

D. Subsection Arrangement

0. Reviews
1. Acceleration and accelerators
 - Ion sources and beams
 - Injectors
 - Targets
 - Colliders
 - Magnets
 - Shielding
 - Meson generators
 - Storage rings
 - Cavity resonators
 - Vacuum systems
 - Superconducting systems
2. Nuclear fusion reactors
 - Materials and systems
 - Fuels and plasmas
 - First walls, liners and vessels
 - Blankets
 - Coolants
 - Divertors and limiters
 - Injectors
 - Magnets
 - Shielding
 - Vacuum systems
 - Characteristics
3. Nuclear fission reactors (general and theoretical studies)
 - Design and characteristics
 - Start-up and shut-down
 - Power
 - Criticality, reactivity, neutronics
 - Thermal behavior
 - Accidents
4. Nuclear fission reactor materials and systems
 - Shielding
 - Control rods
 - Moderators
 - Nuclear poisons
 - Coolants, cooling, heat transfer systems
5. Nuclear fission reactor fuels and fuel cycles
 - Fuel preparation, cladding
 - Properties, irradiation behavior, evaluation
 - Reprocessing
 - Transportation, storage, safeguards
6. Isotopes and isotopic radiation sources
 - Preparation and separation
 - Handling, packaging, transportation, storage
 - Applications

7. Detection and counting of elementary particles, heavy ions, radiation; radiation detectors, counters and spectrometers
 - Cloud and ionization chambers
 - Scintillators
 - Dosimeters and dosimetry
 - Flux measurements
 - Nuclear emulsions
 - Autoradiography
8. Evaluation of nuclear materials
9. Interactions of elementary particles, heavy ions, radiation in bulk matter
 - Absorption and attenuation
 - Scattering
10. Health physics and safety
11. Radioactive wastes and waste treatment
 - Immobilization
 - Storage and disposal
12. Radiation damage
13. Nuclear batteries, auxiliary power systems, and propulsion devices; nuclear explosive devices, explosions and related studies
14. Other

Section 72: Electrochemistry

A. Coverage in This Section

1. Electrochemical theory (e.g., simulation of electrode reactions and kinetics, voltammograms). (See B.2, B.3)
2. Electrode potentials; electrolytic polarization and depolarization; electrochemistry of interfaces (electrode/electrolyte, electrolyte/electrolyte and other liquid-liquid, including studies by means of photocurrent, photovoltaic, and thermoelectric techniques); sorption by electrodes.
(See B.1, B.4, B.11, C.1)
3. Electrode reactions (including kinetics and mechanisms) of inorganic and organic compounds (e.g., electrooxidation, redox, electrohalogenation, electropolymerization, Kolbe's reaction, electrochemical intercalation and doping, photoelectrochemical reactions) when the primary emphasis is on the electrochemical aspects, rather than on the products. Electrocatalysts.
(See B.1, B.4, C.2)
4. Nonindustrial electrolysis and electrochemical synthesis of inorganic and organic compounds, when primary emphasis is on the electrochemical aspects.
(See B.4, C.2)
5. Industrial electrochemical processes involving metals, alloys, cermets and other types of composites, semiconductors, etc.:
 anodic (e.g., anodization, coloring of anodic coatings, etching, machining, polishing);
 cathodic (e.g. electrodeposition or electroplating, electrorecovery and electrorefining, electrocrystallization).
 Characterization of metal and alloy electrodeposits.
(See B.5-B.8, C.3)
6. Other industrial electrochemical processes (with novelty in or major emphasis on the electrochemical aspects); large-scale electrosyntheses; water and brine electrolysis.
(See B.4, C.2)
7. Corrosion:
 theory and mechanism;
 electrochemical studies (including detection and testing) by means of polarization, impedance measurements, etc.
 Anodic and cathodic protection, electrochemical passivation and depassivation.
(See B.9, B.10, C.3)
8. Instrumental techniques not intended for chemical analysis (e.g., voltammetry, polarography, chronopotentiometry, chronoamperometry. (See B.13)
9. Electrochemical apparatus:
 electrodes, electrochemical cells and systems (e.g., standard and electrolytic cells);
 instrumentation.
(See B.11-B.13)

B. Alternative Placement and Exclusion from Coverage in CA

1. Electrochemistry of biological systems: Appropriate biochemistry section.
2. Electrokinetic phenomena of colloids and surfaces: Section 66: "Surface Chemistry and Colloids"
3. Electrolytic conductivity:
 Section 76: "Electric Phenomena"
 Section 68: "Phase Equilibria, Chemical Equilibria, and Solutions" when explicitly related to solution theory or structure

4. Electrochemical reactions and syntheses with emphasis on the reactants and/or compounds being prepared, rather than on the electrode processes, electrochemical conditions, etc.: Section appropriate for the substance.
5. Electrowinning and electrorefining if major interest is in the metal obtained and the electrochemical aspects are incidental: Section 54: "Extractive Metallurgy"
6. Electrochemical treatment of metals and other materials when primary emphasis is on the material and/or its use, not on the electrochemical aspects: Section appropriate for the material under study.
7. Metal and alloy electrodeposits when primary emphasis is on the material and/or its use, rather than on the electrochemical aspects of deposition: Section appropriate for the material or its application.
8. Electrodeposition of nonmetallic coatings (e.g., paints): Section 42: "Coatings, Inks, and Related Products"
9. Corrosion studies where primary interest is in a metal or alloy, rather than in electrochemical aspects:
Section 55: "Ferrous Metals and Alloys"
Section 56: "Nonferrous Metals and Alloys"
10. Corrosion studies on nonmetallic materials: Section appropriate for the material under study.
11. Electrodes (anodes, cathodes) and electrical processes not involving electrochemical reactions (e.g., cathode emitters, electrothermal processes, electrophoresis, electro dialysis, electrodecantation):
Section 66: "Surface Chemistry and Colloids"
Section 76: "Electric Phenomena"
or other section appropriate for the study.
12. Electrochemical energy conversion devices (e.g., batteries and fuel cells): Section 52: "Electrochemical, Radiational, and Thermal Energy Technology"
13. Electroanalytical techniques and apparatus intended for chemical analysis (e.g., ion-selective electrodes, polarographs); analysis of electrolytes, electroplating baths, electrodeposits, etc.: Appropriate analytical chemistry section.

C. Cross-References

1. A.2 - For interfacial and sorption studies Section 66: "Surface Chemistry and Colloids"
2. A.3, A.4, A.6 - Cross-refer to section appropriate for the reaction and/or the substance under study.
3. A.5, A.7 - Cross-refer to section appropriate for the metal, alloy, etc. involved in the study.

D. Subsection Arrangement

0. Reviews
1. Electrochemical theory
2. Electrodes, electrode reactions, electrode potentials
3. Electrochemical cells and systems
4. Nonindustrial electrochemical syntheses and preparations
5. Fused-salt electrochemistry
6. Corrosion
 - Theory and mechanisms
 - Detection and testing
 - Control, inhibition and prevention, passivation
7. Industrial anodic processes
 - Anodizing
 - Electrochemical coloring
 - Electrolytic machining, etching and polishing
8. Industrial cathodic processes
 - Electrowinning

- Electrorefining
 - Electrodeposition
 - Electroforming
 - Electrocrystallization
9. Other industrial electrochemical processes
 - Electrosyntheses
 - Water and brine electrolysis
 10. Instrumental techniques and apparatus (nonanalytical)
 11. Other

Section 73: Optical, Electron, and Mass Spectroscopy and Other Related Properties

A. Coverage in This Section

1. Spectroscopic theory (quantum mechanics, atomic and molecular orbitals, crystal field theory, etc., as explicitly related to spectroscopy).
(See B.1, C.1)
2. Optical properties:
 - reflection, refraction, birefringence, dichroism;
 - light and laser-beam scattering;
 - electrooptical and magneto-optical effects;
 - photochromism (without photochemical interest) and thermochromism;
 - optical double resonances, nonlinear effects.
 (See B.2, B.5, B.6, B.8, B.10-B.14)
3. Spectroscopic studies (absorption, emission, reflection, scattering) in the x-ray, ultraviolet, visible, infrared, microwave, and radio-wave regions, including Raman scattering and luminescence. (See B.2-B.9, B.14)
4. Electron spectroscopy (electron-impact, photoelectron, photoionization, Auger). (See B.1, B.8, B.17, C.2)
5. Moessbauer spectrometry. (See B.2)
6. Mass spectrometry. (See B.2, B.3)
7. Astrophysical (stellar, solar) spectral studies pertaining to:
 - a. chemical composition of celestial bodies or space;
 - b. emission or absorption by chemical elements or compounds if the causative agent is identified.
 (See B.3, B.23)
8. Lasers, masers, and other quantum amplifiers (including x-ray and gamma-ray lasers). Laser and maser radiation.
(See B.2, B.8-B.16, B.22, B.23)
9. Optical materials (e.g., phosphors, fibers, laser and nonlinear materials, antireflective films). (See B.15, B.16, B.18, B.19)
10. Apparatus:
 - sources and detectors for electromagnetic radiation (radio-wave through x-ray regions);
 - spectrometers, spectrophotometers, spectrographs, fluorimeters;
 - dichrometers, optical wave guides, etc.
 (See B.11, B.18-B.23)

B. Alternative Placement and Exclusion from Coverage in CA

1. General studies on atoms and molecules (including binding forces, interactions, collisions, electronic structures, energy levels and band structures, rotation and vibration, force constants, oscillator strengths) without emphasis on spectroscopic aspects: Section 65: "General Physical Chemistry"
2. Spectroscopic and optical methods used as tools (e.g., in studies of structure, reaction dynamics, chemical analysis, etc.): Section appropriate to the primary emphasis of the study
 - Section 9: "Biochemical Methods"
 - Section 22: "Physical Organic Chemistry"
 - Section 59: "Air Pollution and Industrial Hygiene"
 - Section 67: "Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms"
 - Section 74: "Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes"
 - Section 78: "Inorganic Chemicals and Reactions"
 - Section 80: "Organic Analytical Chemistry"

3. Spectroscopic studies of the cosmochemistry of the solar system (other than that of the sun itself); Section 53: "Mineralogical and Geological Chemistry"
4. Electrical measurements (dielectric, deep-level, thermocurrent, etc.) referred to as spectroscopy: Section 76: "Electric Phenomena"
5. Optical properties and spectra of polymers, plastics, protective and decorative coatings:
Section 36: "Physical Properties of Synthetic High Polymers"
Section 42: "Coatings, Inks, and Related Products"
or other appropriate macromolecular section.
6. Crystal defects and color centers with emphasis on formation and transformations; phonon spectra and dispersion with emphasis on lattice dynamics; x-ray reflection, scattering, and diffraction in crystallography: Section 75: "Crystallography and Liquid Crystals"
7. X-ray emission following nuclear decay or reactions; spectra of exotic atoms; gamma ray spectrometry; cosmic rays: Section 70: "Nuclear Phenomena"
8. Photoelectric effects (photoconduction, photovoltaic effect, photoionization in generation of current carriers, photoemission studies not spectroscopic in nature); photodielectric effects:
Section 52: "Electrochemical, Radiational, and Thermal Energy Technology"
Section 72: "Electrochemistry"
Section 76: "Electric Phenomena"
9. Plasma studies (including laser-induced plasmas) without primary spectroscopic interest:
Section 71: "Nuclear Technology"
Section 76: "Electric Phenomena"
10. Light- and radiation-induced processes more suitable to other sections: Section appropriate to the primary emphasis of the study (e.g., photodesorption in Section 66: "Surface Chemistry and Colloids"; photoelectrochemistry in Section 72: "Electrochemistry"; photoreactions in Section 74: "Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes").
11. Photography and photoimaging; optical recording; laser holography; photochemical hole burning; photochemical aspects of photochromism, photoionization, etc.; optical displays: Section 74: "Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes"
12. Optical (laser-induced) damage:
Section 74: "Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes"
Section 75: "Crystallography and Liquid Crystals"
Section 76: "Electric Phenomena"
or other section appropriate for the material studied.
13. Biochemical effects of electromagnetic radiation: Section 8: "Radiation Biochemistry" or other appropriate biochemical section.
14. Optically detected and laser magnetic resonances: Section 77: "Magnetic Phenomena"
15. Optical ceramics and glasses (including fibers) with emphasis on the technology of manufacture and processing: Section 57: "Ceramics"
16. Crystal growth, epitaxy, plastic fabrication, and other aspects of material processing without primary emphasis on optical properties; Section appropriate for the material under study (e.g., Section 38: "Plastics Fabrication and Uses", Section 49: "Industrial Inorganic Chemicals", Section 75: "Crystallography and Liquid Crystals").
17. Electron and tunneling microscopy: Section 76: "Electric Phenomena" or other section appropriate for the study.
18. Electric lamps not intended for spectroscopic purposes: Section 76: "Electric Phenomena"

19. Photoconductors, photoemitters (photocathodes), photodiodes, and photoelectric (solar) cells:
 - Section 52: "Electrochemical, Radiational, and Thermal Energy Technology"
 - Section 76: "Electric Phenomena"
20. Electron sources and optics not explicitly associated with spectrometers: Section 76: "Electric Phenomena"
21. Electron and x-ray detectors and spectrometers intended for nuclear studies: Section 71: "Nuclear Technology"
22. Apparatus (radiometers, lidars) for atmospheric studies:
 - Section 53: "Mineralogical and Geological Chemistry"
 - Section 59: "Air Pollution and Industrial Hygiene"
23. Excluded from coverage in CA:
 - a. Astrophysical phenomena nonchemical in nature (e.g., luminosity, photometry, age, distance, star classification, emission and propagation (Doppler effects) of electromagnetic radiation where no chemical substance is identified, motion of celestial bodies, such as rotation and radial velocity, extraterrestrial plasmas, solar physics).
 - b. Laser and maser design and engineering (electrical, mechanical, optical), without theoretical, spectroscopic or material interest.
 - c. Instruments not intended for spectroscopic use and without material interest (e.g., interferometers, telescopes, microscopes, microwave sources and devices, waveguides).
 - d. Laser beam propagation and mode dispersion, as in waveguides.
 - e. Optical communication, computers and pattern recognition, and devices therefor.

C. Cross-References

1. A.1 - Section 65: "General Physical Chemistry"
2. A.4 -
 - Section 65: "General Physical Chemistry" For electron-impact spectroscopy
 - Section 76: "Electric Phenomena" for electron emission and photoelectron spectroscopy

D. Subsection Arrangement

0. Reviews
1. Spectroscopic theories
 - Quantum mechanical, atomic and molecular orbital calculations
 - Energy level and oscillator strength calculations
 - Crystal field theory calculations
 - Normal coordinate analysis
 - Molecular constant calculations
2. Optical properties (linear)
 - Refraction
 - Birefringence
 - Optical rotation
 - Light scattering
 - Dichroism
 - Chemical microscopy

3. Vibrational and rotational spectroscopy
 - Infrared
 - Raman
 - Microwave
 - Radio-wave
4. Electronic spectroscopy
 - Ultraviolet
 - Visible
 - Near-infrared
5. Luminescence
 - Fluorescence
 - Phosphorescence
 - Phosphors
6. Electron, x-ray, and photoelectron spectroscopy
 - X-ray emission (fluorescence) and absorption
 - Auger spectroscopy
 - Electron-beam spectroscopy (e.g., energy-loss)
 - Ultraviolet and x-ray photoelectron spectroscopy
 - Photoionization spectroscopy
7. Moessbauer spectrometry
8. Mass spectrometry
9. Astrophysical spectra
10. Lasers and masers, nonlinear optical properties
 - Quantum and parametric amplification
 - Nonlinear properties
 - Materials and apparatus
11. Spectrometers and optical apparatus
 - Spectrophotometers
 - Detectors
 - Light and radiation sources for spectroscopic use
 - Optical fibers and waveguides
12. Other

Section 74: Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes

A. Coverage in This Section

1. Photochemistry and radiation chemistry (resulting from electromagnetic and particulate irradiation), when primary emphasis is on the physical aspects of the process (especially as it involves the dynamics of the initial excitation process):
 - mechanism, kinetics, and catalysis;
 - chemical and physical processes of excitation and quenching (including multiphoton processes, excimers and exciplexes), photosensitization, photoinduced electron and energy transfer, photoionization in photochemical processes, photochemical hole burning, photochemical aspects of photochromism, etc.;
 - photochemistry of the atmosphere and space;
 - novel photochemical systems for solar energy conversion.(See B.1-B.8, C.1, C.2)
2. Spectrometry, fluorometry, photometry, actinometry, etc. in study of intermediates, transient species and products in radiation chemistry and photochemistry.
(See B.9, C.3)
3. Photographic chemistry:
 - materials and imaging processes involving both silver halide and silverless compositions; emulsions, films, papers and plates (including components such as gelatin, sensitizers, dyes, supporting and protective layers);
 - processing materials for image development.(See B.10-B.13, B.22-B.24)
4. Image duplication and systems:
 - electrophotographic, photoelectrophoretic, photodeformation, photochromic;
 - electrochromic, electrographic, magnetographic;
 - thermochromic, thermographic;
 - diazo.Photopolymers, photoconductors, sensitizers, toners, developers, receptor sheets.
(See B.13-B.15, B.24, C.4)
5. Recording and storage of information. (See B.13, B.15)
6. Holography. (See B.8, B.24)
7. Copying paper and receptor sheets (pressure-sensitive, thermographic, electrophotographic, etc., but not including carbon paper). (See B.16)
8. Printing (impact and nonimpact):
 - lithography, letterpress, ink-jet, thermal (direct and transfer);
 - electrography, electrophotography, magnetography.(See B.13-B.18, B.24)
9. Photolithography and microlithography. Photomasks. Photoresists and other radiation-sensitive resists (x-ray, electron-beam). (See B.19)
10. Radiography and tomography:
 - image formation, storage, and display;
 - materials (including emulsions, luminescent screens, phosphors, films) and processes of chemical interest.(See B.20, B.21)

11. Image conversion and display with chemical interest. (See B.21, B.24)
12. Apparatus associated with photochemistry, radiochemistry, photography, imaging and recording, display, etc., with chemical interest. (See B.15, B.16, B.18, B.21)

B. Alternative Placement and Exclusion from Coverage in CA

1. Radiation and photochemical effects in biological systems: Section 8: "Radiation Biochemistry"
2. Radiation used merely as a source to effect a chemical reaction, without concern for radiochemical or photochemical mechanisms, etc.: Section appropriate to the reaction being studied.
3. Mechanistic studies of photochemical and radiochemical reactions of organic compounds where the primary interest is in the compounds, rather than in the physical aspects of the initial excitation processes: Section 22: "Physical Organic Chemistry"
4. Devices and nonnovel systems for conversion of solar energy: Section 52: "Electrochemical, Radiational, and Thermal Energy Technology"
5. Radiation effects on inanimate systems not regarded as an aspect of radiation chemistry study: Section 71: "Nuclear Technology" or other section appropriate for the study.
6. Photoelectrochemistry with emphasis on electrochemical aspects, electrodes, etc.: Section 72: "Electrochemistry"
7. Radiolytic, photolytic, photographic, photometric, etc. methods in chemical analysis: Appropriate analytical chemistry section.
8. Photophysical hole burning; photoionization and photochromism not explicitly concerned with photochemistry; holographic interferometry: Section 73: "Optical, Electron, and Mass Spectroscopy and Other Related Properties"
9. Spectrometry, photometry, etc. not explicitly intended for photochemical or photographic studies: Section 73: "Optical, Electron, and Mass Spectroscopy and Other Related Properties"
10. Synthesis of photographic dyes, dye intermediates, and sensitizers: Section 41: "Dyes, Organic Pigments, Fluorescent Brighteners, and Photographic Sensitizers"
11. Synthesis of other organic compounds used in photographic processes: Appropriate synthetic organic section.
12. Applications of nuclear photographic and radiographic emulsions and photosensitive systems: Section appropriate for the application.
13. Treatment of photographic and other reprographic wastes:
Section 60: "Waste Treatment and Disposal"
Section 54: "Extractive Metallurgy" for recovery of metals (e.g., silver from photoprocessing wastewaters)
14. Photoconductors and other electrical materials and devices without explicit emphasis on electrophotography or other electrical duplication or imaging systems: Section 76: "Electric Phenomena"
15. Magnetic recording materials (e.g., alloys, ferrites), including their properties and processing: Section 77: "Magnetic Phenomena"
16. Printing paper (other than receptor sheets for electrophotography, thermography, etc.) and carbon paper:
Section 38: "Plastics Fabrication and Uses"
Section 43: "Cellulose, Lignin, Paper, and Other Wood Products"
17. Printing inks (other than those intended for nonimpact printing, but including inks for jet printing); printing on wall coverings, posters, ceramics: Section 42: "Coatings, Inks, and Related Products"
18. Printing on textiles and carpets: Section 40: "Textiles and Fibers"
19. Fabrication and characteristics of electrical components without primary emphasis on microlithography or resists: Section 76: "Electric Phenomena"
20. Radiography and tomography in biochemical and medical or other use-oriented studies: Appropriate biochemistry section or other section appropriate to the study.

21. Phosphors and luminescent screens without explicit radiographic interest: Section 73: "Optical, Electron, and Mass Spectroscopy and Other Related Properties"
22. Chemical analysis of photographic and reprographic materials, with emphasis on the analytical method:
Section 79: "Inorganic Analytical Chemistry"
Section 80: "Organic Analytical Chemistry"
23. Optical and radiation apparatus without explicit intended use for reprography (e.g., detectors, optical and holographic components):
Section 71: "Nuclear Technology"
Section 73: "Optical, Electron, and Mass Spectroscopy and Other Related Properties"
24. Excluded from coverage in CA:
 - a. Cameras, optical components, and other optical devices primarily for consumer use and/or without material or chemical interest.
 - b. Holographic movies; mathematical methods for computerized hologram generation; nonchemical holographic applications (e.g., in study of mechanical vibrations, aircraft display elements, optical processors).
 - c. Microscopy and imaging systems without material or other chemical interest.
 - d. Optical computing and image processing.
 - e. Printing presses.

C. Cross-References

1. A.1 - For organic reactions, Section 22: "Physical Organic Chemistry"
2. A.1 - For solar energy conversionm Section 52: "Electrochemical, Radiational, and Thermal Energy Technology"
3. A.2 - Section 73: "Optical, Electron, and Mass Spectroscopy and Other Related Properties"
4. A.4 - For photoconductors, Section 76: "Electric Phenomena"

D. Subsection Arrangement

0. Reviews
1. Radiation chemistry and photochemistry
 - Intermediates and products
 - Apparatus
2. Silver halide photographic chemistry and processes
 - Compositions
 - Emulsions
 - Films and papers
 - Processing
 - Apparatus
3. Electrophotography, electrography, and photoelectrophoretic imaging
4. Photopolymerization imaging systems
5. Photoresists and radiation-sensitive resists
6. Impact and nonimpact printing; platemaking
7. Thermographic, photothermographic, and electrothermographic copying
8. Holography
9. Photochromic, thermochromic, and electrochromic imaging systems

10. Diazo imaging systems
11. Pressure-sensitive copying paper
12. Information recording and storage
13. Other
 - Radiography and tomography
 - Image conversion and imaging/display devices
 - Other imaging techniques and processes

Section 75: Crystallography and Liquid Crystals

A. Coverage in This Section

1. Crystallization and recrystallization, crystal nucleation. Growth of single crystals (including zone melting related to crystal growth). Epitaxy.
(See B.1-B.7, B.18)
2. Growth and microstructure of polycrystalline films. (See B.8)
3. Defect structures:
vacancies, dislocations, interstitial atoms, substitutional defects;
twinning, slip and glide planes; stacking faults, antiphase domains.
Grain boundaries and mosaic structures.
Color centers.
(See B.9, B.10, B.14)
4. Crystal properties:
morphology (habit, growth faces, orientation); mechanical (thermal expansion, hardness, plasticity, elasticity, ferroelasticity, deformation, creep, strength);
lattice dynamics (phonon dispersion, Debye temperatures) and energetics.
(See B.1, B.2, B.9-B.16, B.18, B.25, B.27)
5. Crystal structure (except for natural minerals) and crystallographically determined molecular structures. Polytypism, polymorphism, phase transitions. Ordering. Amorphization of crystalline materials.
(See B.1, B.2, B.17, B.18, B.21, B.22)
6. General methodology of structure determination (including x-ray, neutron, and electron diffractometry). Methods for the experimental determination of structures of amorphous and vitreous materials.
(See B.19, B.20).
7. Liquid crystals, plastic crystals (synthesis; phase structure and transitions; physical properties).
(See B.23-B.27)

B. Alternative Placement and Exclusion from Coverage in CA

1. Crystallography of proteins and enzymes:
Section 6: "General Biochemistry"
Section 7: "Enzymes"
2. Crystallography of synthetic polymers and rubber:
Section 36: "Physical Properties of Synthetic High Polymers"
Section 39: "Synthetic Elastomers and Natural Rubber"
3. Devitrification of technical glasses and formation of glass-ceramics: Section 57: "Ceramics"
4. Electrocrystallization: Section 72: "Electrochemistry"
5. Incidental crystallization as a means of purification: Appropriate substance-related section.
6. Crystallization and recrystallization (grain growth) of specific metals and alloys:
Section 55: "Ferrous Metals and Alloys"
Section 56: "Nonferrous Metals and Alloys"
7. Industrial crystallizers: Section 47: "Apparatus and Plant Equipment" or appropriate industrial section (e.g., for sugar crystallizers, Section 44: "Industrial Carbohydrates").
8. Film deposition and growth (other than epitaxy) more appropriate to other sections: Section appropriate to use or substance (e.g., Section 42: "Coatings, Inks, and Related Products", Section 74: "Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes", or Section 76: "Electric Phenomena").

9. Defect structures where radiation damage is of primary interest: Section 71: "Nuclear Technology" or other section appropriate for the study.
10. Mechanical properties of and defects and disorder in specific metals and alloys; metallurgical aspects of phase transitions (e.g., precipitation hardening):
Section 55: "Ferrous Metals and Alloys"
Section 56: "Nonferrous Metals and Alloys"
11. Energy levels, band structures: Section 65: "General Physical Chemistry"
12. Adsorption and surface and interfacial properties: Section 66: "Surface Chemistry and Colloids"
13. Thermodynamics and thermal properties (other than thermal expansion): Section 69: "Thermodynamics, Thermochemistry, and Thermal Properties"
14. Optical properties: Section 73: "Optical, Electron, and Mass Spectroscopy and Other Related Properties"
15. Electric and dielectric properties; trapping, acceptor and donor centers: Section 76: "Electric Phenomena"
16. Magnetic properties: Section 77: "Magnetic Phenomena"
17. Phase equilibria, including solid solutions, unless primary emphasis is on crystal structure or phase transitions: Section 68: "Phase Equilibria, Chemical Equilibria, and Solutions"
18. Crystallographic properties of natural minerals (including crystal structure and phase transitions): Section 53: "Mineralogical and Geological Chemistry"
19. Structure studies on the liquid and gaseous states, other than methodology of structure determination:
Section 65: "General Physical Chemistry"
Section 68: "Phase Equilibria, Chemical Equilibria, and Solutions"
20. Structure studies on amorphous and vitreous solids, other than methodology of structure determination:
Section 57: "Ceramics"
Section 65: "General Physical Chemistry"
21. Molecular structure, stereochemistry, and relationships with properties, reactivity, etc., without crystallographic emphasis:
Section 22: "Physical Organic Chemistry"
Section 65: "General Physical Chemistry"
Section 78: "Inorganic Chemicals and Reactions"
or other appropriate substance-related section.
22. Crystallographically determined molecular structures of organic natural products: Appropriate biochemistry or organic section.
23. Synthesis of liquid crystal polymers; physical properties of liquid crystal polymers with emphasis on polymeric nature:
Section 35: "Chemistry of Synthetic High Polymers"
Section 36: "Physical Properties of Synthetic High Polymers"
or other appropriate macromolecular chemistry section.
24. Liquid crystals and other mesophases as biomembranes: Section 6: "General Biochemistry"
25. Applications of crystals and liquid crystals: Appropriate use-oriented section.
26. Chemical analysis of crystals and liquid crystals:
Section 79: "Inorganic Analytical Chemistry"
Section 80: "Organic Analytical Chemistry"
or other section appropriate for analysis.
27. Excluded from coverage in CA:
Physics of crystals and mesophases without interest in chemical or physicochemical aspects.

C. Cross-References

None

D. Subsection Arrangement

0. Reviews
1. Crystallization and recrystallization, nucleation, crystal growth, epitaxy, nonepitaxial film deposition
2. Crystal morphology (habit), orientation, crystallinity
3. Crystal defects, color centers, domain structures
4. Mechanical properties of crystals
5. Lattice dynamics, statics and energetics
 - Phonon dispersion
 - Debye temperature
6. Other crystal properties
 - Atomic scattering factors
 - Superlattice strain
7. Polytypism, polymorphism, crystal phase transitions, ordering, amorphization
8. Crystal structure
9. Methods for experimental determination of structures of amorphous and vitreous substances
10. Crystallographic methods and apparatus for structure determination
11. Liquid crystals, plastic crystals
12. Other
 - Texture, microstructure, mosaic structure
 - Surface structure from crystallographic point of view (diffraction, microscopy patterns)
 - Electron microscopy

Section 76: Electric Phenomena

A. Coverage in This Section

1. Electric transport properties:
 - conduction (including electrolytic conduction, semiconduction, photoconduction, and superconduction) in gases, liquids, and solids;
 - currents (including photocurrents, current-potential relationships);
 - resistance (including magnetoresistance and piezoresistance);
 - electronic and ionic carrier processes and parameters (mobility, effective mass, recombination, trapping);
 - photovoltaic, thermoelectric, acoustoelectric, and galvanomagnetic effects.(See B.1, B.5, B.7-B.10, B.15, B.20, B.24)
2. Conductors, resistors, contacts, electrodes. Semiconductors and semiconductor devices (organic and inorganic). Superconductors and superconductor devices. Photoconductors, photoelectric devices. Thermoelectric devices. Other electric apparatus and components.
(See B.1-B.4, B.15, B.16-B.19, B.24)
3. Electric fields, polarization (poling), electrification. Capacitance, dielectric and ferroelectric properties. Piezoelectricity, pyroelectricity, electrostriction.
(See B.3, B.10-B.13, B.16, B.20, B.21, B.24)
4. Dielectrics and insulators, capacitors, electrets. Metal-insulator-metal (MIM, MOM) devices.
(See B.11, B.12, B.16, B.17, B.19, B.24)
5. Atomic and molecular electric moments (dipole, quadrupole, etc.) and polarizabilities (unless explicitly related to electronic structure).
(See B.6)
6. Gas discharges (arcs, sparks, coronas). Nonthermonuclear plasmas.
(See B.3, B.22-B.24)
7. Electron and ion emission (thermionic, field, secondary, photoelectric). Work function. Cathode emitters and photocathodes. Electron and ion sources.
(See B.2, B.3, B.14, B.18)

B. Alternative Placement and Exclusion from Coverage in CA

1. Electrochemistry (other than electrolytic conduction): Section 72: "Electrochemistry"
2. Devices for power engineering (e.g., solar and thermovoltaic cells, thermionic energy converters):
 - Section 52: "Electrochemical, Radiational, and Thermal Energy Technology"
 - Section 71: "Nuclear Technology"
3. Electrooptical effects; cathodoluminescence, electroluminescence, phosphors; electric light sources for spectroscopic applications, lasers, light-emitting and luminescent devices; light detectors: Section 73: "Optical, Electron, and Mass Spectroscopy and Other Related Properties"
4. Devices for light and radiation detection:
 - Section 71: "Nuclear Technology"
 - Section 73: "Optical, Electron, and Mass Spectroscopy and Other Related Properties"
5. Energy levels, band structures, Fermi surfaces (except as related to electric transport phenomena or trapping, acceptor and donor levels): Section 65: "General Physical Chemistry"
6. Atomic and molecular polarizability and moments when explicitly related to electronic structure:
 - Section 65: "General Physical Chemistry"
 - Section 22: "Physical Organic Chemistry" if related to molecular structures of organic compounds

7. Electrodiffusion (unless involved in doping or carrier transport studies): Section 65: "General Physical Chemistry"
8. Electrical properties of colloids; electrokinetic phenomena of colloids and surfaces: Section 66: "Surface Chemistry and Colloids"
9. Electrolytic conductivity in structure-related solution studies: Section 68: "Phase Equilibriums, Chemical Equilibriums, and Solutions"
10. Electric properties of synthetic polymers and plastics (other than studies on conduction mechanism or doped polymers as conductors): Section 36: "Physical Properties of Synthetic High Polymers" or other appropriate macromolecular chemistry section.
11. Polymeric insulators:
 - Section 38: "Plastics Fabrication and Uses"
 - Section 39: "Synthetic Elastomers and Natural Rubber"
 - Section 42: "Coatings, Inks, and Related Products"
12. Electrical ceramics and glasses with emphasis on the technology of manufacture and processing: Section 57: "Ceramics"
13. Electrophotography, lithography and photoresists: Section 74: "Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes"
14. Electron-impact and photoelectron spectroscopy with emphasis on methodology and/or electronic structure:
 - Section 73: "Optical, Electron, and Mass Spectroscopy and Other Related Properties"
 - Section 22: "Physical Organic Chemistry" if emphasis is on molecular structures of organic compounds
15. Temperature-determining and heat-sensing devices used in calorimetry, thermogravimetry, etc.: Section 69: "Thermodynamics, Thermochemistry, and Thermal Properties"
 - Industrial temperature-determining and heat-sensing devices: Section 47: "Apparatus and Plant Equipment"
16. Electromagnetism; magnetic properties of materials of interest to this section: Section 77: "Magnetic Phenomena"
17. Crystallographic aspects of materials of interest to this section (e.g., crystal growth, epitaxy, phase transitions): Section 75: "Crystallography and Liquid Crystals"
18. Electrical materials and devices for nuclear applications: Section 71: "Nuclear Technology"
19. Chemical analysis of materials of interest to this section; electrical phenomena in chemical analysis; electrical apparatus intended for use in chemical analysis: Appropriate analytical chemistry section.
20. Electric properties of biochemical materials and systems: Appropriate biochemistry section.
21. Crystal fields and external electric fields when emphasis is on effects other than electrical: Section appropriate for the study.
22. Thermonuclear plasmas: Section 71: "Nuclear Technology"
23. Atmospheric and astrophysical plasmas:
 - Section 53: "Mineralogical and Geological Chemistry"
 - Section 70: "Nuclear Phenomena"
24. Excluded from coverage in CA:
 - a. Physics and engineering physics of electricity and low-energy (nonthermonuclear) plasmas.
 - b. Electrical engineering and engineering physics of electronic devices and structures (e.g., design, electrical characteristics) not explicitly related to material properties and/or chemical processing.

C. Cross-References

None

D. Subsection Arrangement

0. Reviews

1. Conduction and conductivity, semiconductivity, resistance, current carriers, galvanomagnetic and acoustoelectric effects
2. Conductors, semiconductors, resistors, contacts
3. Semiconductor junctions and devices
4. Superconductivity, superconductors, superconductive devices
5. Photoconductivity, photoconductors, photovoltaic effect, photoelectric devices
6. Thermoelectricity, pyroelectricity, thermoelectric devices
7. Piezoelectricity, piezoelectric and acoustoelectric devices, electrostriction
8. Ferroelectricity
9. Dielectric and electret properties (including electric moments, and polarizability)
10. Capacitors, dielectrics, insulators, electrets
11. Gas discharges (arcs, sparks, coronas), plasmas
12. Electron and ion emission (thermionic, field, secondary, photoelectric), work function, emitters
13. Other electrical effects
 - Electrification
 - Electrodeformation
14. Other devices
 - Acoustoelectric
 - Memory
 - Rectifiers

Section 77: Magnetic Phenomena

A. Coverage in This Section

1. Magnetic properties (susceptibility, induction, hysteresis, anisotropy, moment). Domain structure. Magnetostriction.
(See B.1-B.4, B.8, B.9)
2. Magnetic materials (e.g., ferrous alloys, ferrites): preparation and chemical composition as related to magnetic properties or applications.
(See B.5, B.7)
3. Chemical aspects of material processing for magnets, magnetic memory and recording devices, magnetometers, etc. (See B.7, B.9)
4. Chemical aspects of magnetohydrodynamic and thermomagnetic effects. (See B.6, B.9)
5. Magnetic and related resonances and magnetic resonance spectrometry:
 - cyclotron resonance;
 - electron spin resonance (including paramagnetic, ferromagnetic, antiferromagnetic, conduction-electron resonances);
 - nuclear magnetic and nuclear quadrupole resonance;
 - Overhauser effect and Knight shift;
 - double resonances;
 - acoustic magnetic resonances, muon spin resonance.(See B.8, B.9)

B. Alternative Placement and Exclusion from Coverage in CA

1. Magnetic properties of polymers: Section 36: "Physical Properties of Synthetic High Polymers"
2. Galvanomagnetic properties (Hall effect, magnetoresistance) and electrical properties of materials of interest to this section: Section 76: "Electric Phenomena"
3. Crystallographic properties of materials of interest to this section: Section 75: "Crystallography and Liquid Crystals"
4. Magneto-optical properties: Section 73: "Optical, Electron, and Mass Spectroscopy and Other Related Properties"
Magneto-optical recording: Section 74: "Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes"
5. Synthesis of ferrites and other inorganic compounds when not related to magnetic properties or applications: Section 78: "Inorganic Chemicals and Reactions"
6. Magnetohydrodynamic studies related to energy technology applications:
 - Section 52: "Electrochemical, Radiational, and Thermal Energy Technology"
 - Section 71: "Nuclear Technology"
7. Chemical analysis of materials of interest to this section:
 - Section 79: "Inorganic Analytical Chemistry"
 - Section 80: "Organic Analytical Chemistry"
8. Magnetic properties, resonance spectrometry and imaging, and related apparatus involved in chemical analysis or in studies not primarily concerned with magnetic aspects: Section appropriate to the study.
9. Excluded from coverage in CA:
 - a. Design and engineering of magnets, magnetometers, recording apparatus, and other magnetic devices unrelated to material properties and/or chemical processing.
 - b. Physics of magnetism.

C. Cross-References

None

D. Subsection Arrangement

0. Reviews
1. Magnetic properties
 - Susceptibility
 - Magnetization, induction
 - Anisotropy
 - Hysteresis
 - Domains
 - Magnetostriction
2. Thermomagnetic effects
3. Ferrites
4. Magnets
5. Magneto hydrodynamics
6. Electron resonances
 - Cyclotron resonance
 - Electron spin resonance
 - Electric resonance absorption
 - g-factors
 - Spin-spin and spin-lattice relaxation
7. Nuclear resonances
 - Nuclear magnetic resonance
 - Electron-nuclear double and triple resonances
 - Nuclear quadrupole resonance
 - Acoustic nuclear magnetic resonance
 - Nuclear spin coupling
 - Nuclear magnetic relaxation
 - Overhauser effect
 - Knight shift
 - Muon spin resonance
8. Other

Section 78: Inorganic Chemicals and Reactions

A. Coverage in This Section

1. Nonindustrial preparation and/or purification of new and known inorganic substances (unless the sole intent is to prepare such substances with particular properties and/or uses, and the properties and/or uses are studied). Inorganic substances, as intended here, include the following:
 - a. elements (including carbon and its allotropic forms diamond, graphite, and fullerenes not containing organic substituents);
 - b. inorganic compounds: acids, bases and salts; metal oxides and hydroxides; hydrides, borides, nitrides, silicides, phosphides, etc.; synthetic minerals and molecular sieves; addition compounds (e.g., clathrates and other intercalation compounds, charge-transfer complexes) with at least one inorganic component;
 - c. carbon-containing compounds not appropriate for the organic sections: carbon oxides and sulfides, carbides, metal carbonyls and thiocarbonyls, cyanides, isocyanides, cyanates, isocyanates, thiocyanates, carbonates, metal salts of carboxylic acids and alcohols, alcoholates and other solvates;
 - d. coordination compounds containing inorganic and/or organic ligands (including models for biochemical systems when primary emphasis is on the preparation);
 - e. metalloid and other nonmetal compounds (without organic substituents): ammonium salts, interhalogens, chalcogen and pnictogen halides and oxides, borazines, phosphonitriles, rare gas compounds, etc.;
 - f. intermetallic compounds.
(See B.1-B.13, B.16, C.1)
2. Characterization (composition, physicochemical properties, molecular structure, etc.) of new and known inorganic substances when the emphasis is on the substance, rather than on particular properties and/or uses or on methods by which composition, properties, etc. are studied. (See B.1-B.13, B.16, C.1)
3. Nonpreparative reactions of inorganic compounds without emphasis on mechanism or kinetics (including thermal decompositions, dehydrations and other degradations, and reactions involving natural minerals other than those reactions that are carried out for the purpose of simulating naturally occurring mineralogical processes). (See B.1, B.2, B.5, B.6, B.14, B.15)

B. Alternative Placement and Exclusion from Coverage in CA

1. Compounds with carbon-metal and carbon-metalloid bonds (other than those listed in A.1.c), and organic derivatives of oxo (thioxo, etc.) acids of boron and the Group VA (Group 15) elements: Section 29: "Organometallic and Organometalloidal Compounds"
2. Salts of carboxylic acids and alcohols when emphasis is on the organic moiety: Appropriate organic section.
3. Coordination complexes as models for biochemical systems when the primary emphasis is not preparative:
Section 6: "General Biochemistry"
Section 7: "Enzymes"
or other appropriate biochemistry section.
4. Industrial preparations and applications: Section 49: "Industrial Inorganic Chemicals" or section appropriate to the material studied.
5. Mineralogical and geological chemistry, including reactions carried out for the purpose of simulating naturally occurring processes: Section 53: "Mineralogical and Geological Chemistry"

6. Physical chemistry (e.g., kinetics and thermodynamics of reactions; crystallographic, electrical, magnetic, optical properties, etc.): Appropriate physical chemistry sections (e.g., Section 67: "Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms", Section 68: "Phase Equilibria, Chemical Equilibria, and Solutions", Section 69: "Thermodynamics, Thermochemistry, and Thermal Properties", Section 73: "Optical, Electron, and Mass Spectroscopy and Other Related Properties"), unless primary emphasis is on preparation and/or purification methods.
7. Carbon fibers prepared by pyrolysis of organic substances: Section 57: "Ceramics"
8. Inorganic polymers (compounds with structures represented by repeating units with degrees of polymerization greater than 10) and coordination polymers containing polymeric ligands:
Section 35: "Chemistry of Synthetic High Polymers"
Section 36: "Physical Properties of Synthetic High Polymers"
9. Electrochemical preparations and reactions, with emphasis on the electrochemistry: Section 72: "Electrochemistry"
10. Photochemical and radiochemical preparations and reactions, with emphasis on the photochemistry or radiochemistry: Section 74: "Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes"
11. Preparation of catalysts with emphasis on catalytic properties: Section 67: "Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms" or section appropriate for the reaction emphasized.
12. Preparation of phosphors: Section 73: "Optical, Electron, and Mass Spectroscopy and Other Related Properties"
13. Preparation of liquid crystals: Section 75: "Crystallography and Liquid Crystals"
14. Hydriding of alloys and intermetallic compounds for the purpose of hydrogen storage: Section 52: "Electrochemical, Radiational, and Thermal Energy Technology"
15. Surface reactions not preparative in nature:
Section 66: "Surface Chemistry and Colloids"
Section 67: "Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms"
or other section appropriate for the study.
16. Chemical analysis of inorganic compounds: Section 79: "Inorganic Analytical Chemistry" or other appropriate section that includes analysis.

C. Cross-References

1. A.1 and A.2 - For preparation of coordination complexes with stated interest as biochemical models
Section 6: "General Biochemistry"
Section 7: "Enzymes"
or other appropriate biochemistry section.

D. Subsection Arrangement

0. Reviews
1. Elements
2. Acids, bases, metal oxides and hydroxides
3. Addition compounds
 - Insertion compounds (clathrates, intercalation compounds)
 - Charge-transfer complexes

4. Synthetic minerals
5. Metal-containing salts and related metal-containing compounds
 - Halides, pseudohalides
 - Chalcogenides
 - Pnictides
 - Carbonates, nitrates, sulfates, phosphates, etc.
 - Hydrides, borides, carbides, silicides, etc.
6. Double salts
7. Coordination compounds
 - Coordinated metals and nonmetals
 - Metal carbonyls
 - Heteropoly acids and salts
 - Cluster compounds (coordinative)
8. Metalloid and nonmetal compounds (with no metal atoms present)
 - Interhalogens
 - Compounds of boron, carbon, silicon, nitrogen, phosphorus, arsenic, the chalcogens and the rare gases
9. Reactions (nonpreparative)
10. Other
 - Intermetallic compounds
 - Heteroatom clusters (noncoordinative)
 - Nomenclature
 - General topics

Section 79: Inorganic Analytical Chemistry

A. Coverage in This Section

1. Methods (including sampling and sample preparation) for the detection and identification of the chemical constituents of samples, and for the determination of their amounts in either the bulk or the surface (other than surface analysis as stated in B.3) of inorganic samples, where the constituents can be:
 - elements (free or combined),
 - compounds,
 - radicals,
 - functional groups, etc.Also included are general analytical methods equally applicable to both inorganic and organic materials (or for which both are involved, but the emphasis is clearly inorganic), and those methods for which the analytes and samples are not identified. (See B.1-B.7, B.13-B.26)
2. Methods for chemical analysis of inorganic materials covered by Section 49: "Industrial Inorganic Chemicals", the energy technology, mineralogy and metallurgy sections (52-56), and the physical and inorganic chemistry sections (65-70). (See B.1-B.7)
3. Inorganic analytical methods of general interest or applicable to more than one of the other sections normally including analytical methods. (See B.13-B.24, C.1)
4. Apparatus for inorganic analysis. (See B.8-B.10, C.2)
5. Reagents (both inorganic and organic) for the detection, separation and identification of inorganic constituents. (See B.11)
6. Inorganic analytical separations. (See B.12)
7. Analysis of soils for inorganic constituents not of agricultural interest. (See B.21)
8. Thermal analysis, thermogravimetry and associated thermal studies when the method is applied for qualitative or quantitative inorganic analysis. (See B.25, C.3)

B. Alternative Placement and Exclusion from Coverage in CA

(Note: For placement in another section that includes analysis, the materials covered by that section must be the actual samples being analyzed or the method must be specified to be for the analysis of those materials when the actual samples analyzed are model systems.)

1. All studies with emphasis on the materials with no discussion of the analytical methods themselves: Section appropriate for the material being studied.
2. Determinations of the properties of substances or systems: Section appropriate for the property or the material under study.
3. Surface analysis in which no data on the qualitative or quantitative composition of the surfaces are reported: Section 66: "Surface Chemistry and Colloids" or section appropriate for the methodology or the material being studied.
4. Isotopic tracer studies in which the interest is in studying properties or reactions and not in the detection, identification or determination of the constituents: Section appropriate for the system being studied.
5. Phase analyses that are studies of the physical properties of systems, not their chemical compositions (e.g., phase structure or transitions):
 - Section 68: "Phase Equilibriums, Chemical Equilibriums, and Solutions"
 - Section 75: "Crystallography and Liquid Crystals"
 - or section appropriate for the system involved.

6. Structural analysis:
Section 75: "Crystallography and Liquid Crystals"
Section 65: "General Physical Chemistry"
or section appropriate for the material under study.
7. Molecular weight determinations: Section 65: "General Physical Chemistry" or section appropriate for the material under study.
8. Apparatus that can be used for several purposes, including analysis, but not specifically stated to be intended for analysis: Section 47: "Apparatus and Plant Equipment" or section appropriate for the application.
9. Leak detectors:
Section 47: "Apparatus and Plant Equipment"
Section 59: "Air Pollution and Industrial Hygiene"
10. Radiation detectors, counters and nuclear spectrometers not intended specifically for use in chemical analysis:
Section 71: "Nuclear Technology"
11. Syntheses or studies of physical properties of analytical reagents with no example of application of the reagents in analysis or study of analytical properties: Section appropriate for the synthesis or the property studied.
12. Theoretical principles and methodology of separations, and preparative chromatography and other separation techniques for the purpose of preparation or purification without stated analytical implications:
Section 48: "Unit Operations and Processes"
Section 66: "Surface Chemistry and Colloids"
Section 68: "Phase Equilibria, Chemical Equilibria, and Solutions"
or other section appropriate for the process of the material being prepared or purified.
13. Analysis of biological specimens or systems: Section 9: "Biochemical Methods" or other appropriate biochemical section.
14. Forensic and toxicological analysis: Section 4: "Toxicology"
15. Determination and analysis of herbicides and pesticides: Section 5: "Agrochemical Bioregulators"
16. Analysis of enzymes: Section 7: "Enzymes"
17. Analysis of tobacco and tobacco products:
Section 4: "Toxicology"
Section 11: "Plant Biochemistry"
18. Analytical studies relating to fermentation: Section 16: "Fermentation and Bioindustrial Chemistry"
19. Analysis of foods, food-related materials (food additives, edible fats and oils, food flavorings) and animal feeds:
Section 17: "Food and Feed Chemistry"
20. Analysis of archaeological and art objects: Section 20: "History, Education, and Documentation"
21. Determination of inorganic constituents of agricultural importance and methods specifically designed for determinations of fertilizer constituents: Section 19: "Fertilizers, Soils, and Plant Nutrition"
22. Analysis of materials covered by the macromolecular sections (Sections 35-46): Appropriate macromolecular chemistry section.
23. Analysis of propellants, explosives, fuels, ceramics, cement, concrete products, sewage, wastes, water, essential oils, cosmetics, and pharmaceuticals: Appropriate applied chemistry section.
24. Analysis for atmospheric pollutants: Section 59: "Air Pollution and Industrial Hygiene"
25. Thermal analysis, thermogravimetry and associated techniques when the interest is in studying properties or thermal decomposition reactions: Section 69: "Thermodynamics, Thermochemistry, and Thermal Properties" or section appropriate for the material being studied.
26. General methods applied to both inorganic and organic materials when emphasis is on the organic components:
Section 80: "Organic Analytical Chemistry"

C. Cross-References

1. A.3 - For studies with multiple interest retained here, cross-refer to appropriate section that includes analytical studies (i.e., Sections 1-20, 35-46, 50-51, 57-62 and 64).
2. A.4 -
Section 72: "Electrochemistry" for electrodes and electrochemical apparatus
Section 73: "Optical, Electron, and Mass Spectroscopy and Other Related Properties" for spectrometers
3. A.8 - Section 69: "Thermodynamics, Thermochemistry, and Thermal Properties"

D. Subsection Arrangement

0. Reviews
1. General
2. Apparatus
3. Reagents
 - Indicators
 - Buffers
 - Chelating and masking agents
 - Standard substances and solutions
4. Separations
 - Dissolution
 - Electrodeposition
 - Extraction
 - Ion exchange
 - Sorption, chromatography
 - Precipitation
 - Volatilization
5. Detections
6. Determinations
7. Other

Section 80: Organic Analytical Chemistry

A. Coverage in This Section

1. Methods (including sampling and sample preparation) for the detection and identification of the chemical constituents of samples, and for the determination of their amounts in either the bulk or the surface (other than surface analysis as stated in B.3), where the samples are organic materials and the constituents can be:
 - elements (free or combined),
 - compounds,
 - radicals,
 - functional groups, etc.Also included are general analytical methods applied to both inorganic and organic methods when the emphasis is on the organic components. (See B.1-B.7, B.13-B.26, B.28)
2. Methods for chemical analysis of organic materials covered by the organic sections (21-34), 52-56, 65-78).
3. Organic analytical methods of general interest or applicable to more than one of the other sections that normally include analytical methods. (See B.13-B.26, C.1)
4. Apparatus for organic analysis. (See B.8-B.10, C.2)
5. Reagents (inorganic and organic) for use in organic analysis. (See B.11)
6. Organic analytical separations. (See B.12)
7. Thermal analysis, thermogravimetry and associated thermal studies when the method is applied to qualitative or quantitative organic analysis. (See B.27, C.3)

B. Alternative Placement and Exclusion from Coverage in CA

(Note: For placement in another section that includes analysis, the materials covered by that section should be actual samples being analyzed or the method specified to be for the analysis of those materials when the actual samples analyzed are model systems.)

1. All studies with emphasis on the material with no discussion of the analytical method itself: Section appropriate for the material under analysis.
2. Determinations of the properties of a substance or system: Section appropriate for the property of the material under study.
3. Surface analysis in which no data on the qualitative and quantitative composition of surfaces are reported: Section 66: "Surface Chemistry and Colloids" or section appropriate for the methodology or the material being studied.
4. Isotopic tracer studies in which the interest is in studying properties or reactions and not in the detection, identification or determination of the constituents: Section appropriate for the system being studied.
5. Phase analyses that are studies of the physical properties of systems, not of their chemical compositions (e.g., phase structure or transitions):
 - Section 68: "Phase Equilibria, Chemical Equilibria, and Solutions"
 - Section 75: "Crystallography and Liquid Crystals"
 - or section appropriate for the methodology or material being studied.
6. Structural analysis:
 - Section 22: "Physical Organic Chemistry"
 - Section 75: "Crystallography and Liquid Crystals"
 - or the section appropriate for the material being studied.
7. Molecular weight determinations: Section 65: "General Physical Chemistry" or section appropriate for the material under study.
8. Apparatus that can be used for several purposes, including analysis, but not specifically stated to be for analysis: Section 47: "Apparatus and Plant Equipment" or section appropriate for the application.

9. Leak detectors:
 - Section 47: "Apparatus and Plant Equipment"
 - Section 59: "Air Pollution and Industrial Hygiene"
 - or other appropriate section.
10. Radiation detectors, counters and nuclear spectrometers not intended specifically for use in chemical analysis:
 - Section 71: "Nuclear Technology"
11. Synthesis or studies of physical properties of analytical reagents with no example of application of the reagents in chemical analysis or study of analytical properties: Section appropriate for the the synthesis or the property studied.
12. Theoretical principles and methodology of separations, and preparative chromatography and other separation techniques without stated analytical application:
 - Section 48: "Unit Operations and Processes"
 - Section 66: "Surface Chemistry and Colloids"
 - Section 68: "Phase Equilibriums, Chemical Equilibriums, and Solutions"
 - or other section appropriate for the method or the material being prepared or purified.
13. Analysis of biological specimens or systems: Section 9: "Biochemical Methods" or other appropriate biochemistry section.
14. Analysis of proteins, nucleic acids and polysaccharides: For analytes of biological origin or in biological systems, Section 9: "Biochemical Methods"
15. Analysis of hormones:
 - Section 2: "Mammalian Hormones"
 - Section 5: "Agrochemical Bioregulators"
 - Section 9: "Biochemical Methods"
16. Forensic and toxicological analysis: Section 4: "Toxicology"
17. Determination and analysis of herbicides and pesticides: Section 5: "Agrochemical Bioregulators"
18. Analysis of enzymes: Section 7: "Enzymes"
19. Analysis of tobacco and tobacco products:
 - Section 4: "Toxicology"
 - Section 11: "Plant Biochemistry"
20. Analytical studies relating to fermentation: Section 16: "Fermentation and Bioindustrial Chemistry"
21. Analysis of foods, food-related materials (food additives, edible fats, food flavorings) and animal feeds: Section 17: "Food and Feed Chemistry"
22. Analysis of archaeological and art objects: Section 20: "History, Education, and Documentation"
23. Determination of organic constituents in soils and methods specifically designed for determination of fertilizer constituents: Section 19: "Fertilizers, Soils, and Plant Nutrition"
24. Analysis of material covered by the macromolecular sections (Sections 35-46): Appropriate macromolecular chemistry section.
25. Analysis of propellants, explosives, fuels and their derivatives, ceramics, cement, concrete products, sewage, wastes, water, essential oils, cosmetics, and pharmaceuticals: Appropriate applied chemistry section.
26. Analysis for atmospheric pollutants: Section 59: "Air Pollution and Industrial Hygiene"

27. Thermal analysis, thermogravimetry and associated techniques when the interest is in studying properties or thermal decomposition reactions: Section 69: "Thermodynamics, Thermochemistry, and Thermal Properties" or section appropriate for the material being studied.
28. General methods equally applicable to both inorganic and organic materials or for which the emphasis is on the inorganic components: Section 79: "Inorganic Analytical Chemistry"

C. Cross-References

1. A.3 - For abstracts of documents with multiple interest retained here, cross-refer to appropriate section that includes analytical studies (i.e., Sections 1-20, 35-46, 50-51, 57-62 and 64).
2. A.4 -
Section 72: "Electrochemistry" for electrodes and electrochemical apparatus
Section 73: "Optical, Electron, and Mass Spectroscopy and Other Related Properties" for spectrometers
3. A.7 - Section 69: "Thermodynamics, Thermochemistry, and Thermal Properties"

D. Subsection Arrangement

0. Reviews
1. General
2. Apparatus
3. Reagents
 - Indicators
 - Buffers
 - Chelating and masking agents
 - Standard substances and solutions
4. Separations
 - Sorption, chromatography
 - Dissolution
 - Extraction
 - Ion exchange
 - Precipitation
 - Volatilization
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A Guide to Use of CA Sections for Retrospective Searching

Introduction

A Guide to Use of CA Sections for Retrospective Searching is intended to serve as an aid for users who want to search retrospectively on the basis of sections from the 14th Collective Index (14CI) period (1997-2001) to the 8th Collective Index (8CI) period.

The starting point of the Guide is the current (11CI - 14CI) coverage of CA sections as described in the 1997 edition of the *Subject Coverage and Arrangement of Abstracts by Sections in CHEMICAL ABSTRACTS (CA Subject Coverage Manual)*. For equivalent coverage, the Guide refers you to appropriate sections in the 10CI through the 9CI (CA Vol. 76 through 95) and the 8CI period (CA Vol. 66 through 75). Boldface is used to designate changes in section number or title.

For detailed information about the coverage of each section during the 14CI period, please refer to the 1997 edition of the *CA Subject Coverage Manual*. For detailed information about the coverage of each section in earlier periods, please refer to the 1992, 1987, 1982, and 1975 editions of the *CA Subject Coverage Manual*.

11CI- 14CI Period Section 1982-2001	10CI and 9CI Period Section 1972-1981	8CI Period Section 1976-1971
1. Pharmacology	1. Pharmacodynamics	15. Pharmacodynamics
2. Mammalian Hormones	2. Hormone Pharmacology	4. Hormones (Vol.66-71); Hormones and Related Substances (Vol.72-75)
3. Biochemical Genetics (New section in 11CI)	For related coverage see sections 6, and 10-13	For related coverage see sections 2, 7-9, and 11
4. Toxicology	4. Toxicology	14. Toxicology
5. Agrochemical Bioregulators	5. Agrochemicals	18. Plant-Growth Regulators 19. Pesticides
6. General Biochemistry	6. General Biochemistry	2. General Biochemistry
7. Enzymes	7. Enzymes	3. Enzymes
8. Radiation Biochemistry	8. Radiation Biochemistry	5. Radiation Biochemistry
9. Biochemical Methods	9. Biochemical Methods	6. Biochemical Methods
10. Microbial Biochemistry	10. Microbial Biochemistry	8. Microbial Biochemistry
11. Plant Biochemistry	11. Plant Biochemistry	7. Plant Biochemistry
12. Nonmammalian Biochemistry Biochemistry	12. Nonmammalian Biochemistry	9. Nonmammalian
13. Mammalian Biochemistry Biochemistry	13. Mammalian Biochemistry	11. Mammalian
14. Mammalian Pathological Biochemistry	14. Mammalian Pathological Biochemistry	12. Mammalian Pathological Biochemistry
15. Immunochemistry	15. Immunochemistry	13. Immunochemistry
16. Fermentation and Bioindustrial Chemistry	16. Fermentations	16. Fermentations
17. Food and Feed Chemistry	17. Foods	17. Foods
18. Animal Nutrition	18. Animal Nutrition	10. Animal Nutrition
19. Fertilizers, Soils, and Plant Nutrition	19. Fertilizers, Soils, and Plant Nutrition	20. Fertilizers, Soils, and Plant Nutrition

11CI- 14CI Period Section 1982-2001	10CI and 9CI Period Section 1972-1981	8CI Period Section 1976-1971
20. History, Education, and Documentation	20. History, Education, and Documentation	1. History, Education, and Documentation
21. General Organic Chemistry	21. General Organic Chemistry	21. General Organic Chemistry
22. Physical Organic Chemistry	22. Physical Organic Chemistry	22. Physical Organic Chemistry
23. Aliphatic Compounds	23. Aliphatic Compounds	23. Aliphatic Compounds
24. Alicyclic Compounds	24. Alicyclic Compounds	24. Alicyclic Compounds
25. Benzene, Its Derivatives, and Condensed Benzenoid Compounds (New Section in 11CI)	25. Noncondensed Aromatic Compounds 26. Condensed Aromatic Compounds	25. Noncondensed Aromatic Compounds 26. Condensed Aromatic Compounds
26. Biomolecules and Their Synthetic Analog (New Section in 11CI)	For related coverage see Sec.23-28, and 33	For related coverage see Sec.23-28, and 33
27. Heterocyclic Compounds (One Hetero Atom)	27. Heterocyclic Compounds (One Hetero Atom)	27. Heterocyclic Compounds (One Hetero Atom)
28. Heterocyclic Compounds (More Than One Hetero Atom)	28. Heterocyclic Compounds (More Than One Hetero Atom)	28. Heterocyclic Compounds (More Than One Hetero Atom)
29. Organometallic and Organometalloidal Compounds	29. Organometallic and Organometalloidal Compounds	29. Organometallic and Organometalloidal Compounds
30. Terpenes and Terpenoids	30. Terpenoids	30. Terpenes (Vol.66-71); Terpenoids (Vol.72-75)
31. Alkaloids	31. Alkaloids	31. Alkaloids
32. Steroids	32. Steroids	32. Steroids
33. Carbohydrates	33. Carbohydrates	33. Carbohydrates

11CI- 14CI Period Section 1982-2001	10CI and 9CI Period Section 1972-1981	8CI Period Section 1976-1971
34. Amino Acids, Peptides, and Proteins	34. Synthesis of Amino Acids, Peptides, and Proteins	34. Synthesis of Amino Acids, Peptides, and Proteins
35. Chemistry of Synthetic High Polymers (New Section in 11CI)	35. Synthetic High Polymers	35. Synthetic High Polymers
36. Physical Properties of Synthetic High Polymers (New Section in 11CI)	35. Synthetic High Polymers	35. Synthetic High Polymers
37. Plastics Manufacture and Processing	36. Plastics Manufacture and Processing	36. Plastics Manufacture and Processing
38. Plastics Fabrication and Uses	37. Plastics Fabrication and Uses	37. Plastics Fabrication and Uses
39. Synthetic Elastomers and Natural Rubber	38. Elastomers, Including Natural Rubber	38. Elastomers, Including Natural Rubber
40. Textiles and Fibers (Textiles in 11CI)	39. Textiles	39. Textiles
41. Dyes, Organic Pigments, Fluorescent Brighteners, and Photographic Sensitizers	40. Dyes, Fluorescent Whitening Agents, and Photosensitizers	40. Dyes, Fluorescent Brightening Agents, and Photosensitizers (Vol. 66-70); Dyes, Fluorescent Whitening Agents, and Photosensitizers (Vol 71-75)
42. Coatings, Inks, and Related Products	42. Coatings, Inks, and Related Products	42. Coatings, Inks, and Related Products
43. Cellulose, Lignin, Paper, and Other Wood Products	43. Cellulose, Lignin, Paper, and Other Wood Products	43. Cellulose, Lignin, Paper, and Other Wood Products
44. Industrial Carbohydrates	44. Industrial Carbohydrates	44. Industrial Carbohydrates
45. Industrial Organic Chemicals, Leather, Fats and Waxes (New Section in 11CI)	41. Leather and Related Materials 45. Fats and Waxes	41. Leather and Related Materials 45. Fats and Waxes
46. Surface-Active Agents and Detergents	46. Surface-Active Agents and Detergents	46. Surface-Active Agents and Detergents

11CI- 14CI Period Section 1982-2001	10CI and 9CI Period Section 1972-1981	8CI Period Section 1976-1971
47. Apparatus and Plant Equipment	47. Apparatus and Plant Equipment	47. Apparatus and Plant Equipment
48. Unit Operations and Processes	48. Unit Operations and Processes	48. Unit Operations and Processes
49. Industrial Inorganic Chemicals	49. Industrial Inorganic Chemicals	49. Industrial Inorganic Chemicals
50. Propellants and Explosives	50. Propellants and Explosives	50. Propellants and Explosives
51. Fossil Fuels, Derivatives, and Related Products	51. Fossil Fuels, Derivatives and Related Products (Vol. 81-95) 51. Petroleum, Petroleum Derivatives, and Related Products (Vol. 76-80) 52. Coal and Coal Derivatives (Vol.76-80)	51. Petroleum, Petroleum Derivatives, and Related Products 52. Coal and Coal Derivatives
52. Electrochemical, Radiational, and Thermal Energy Technology	52. Electrochemical, Radiational, and Thermal Energy Technology (Vol.81-95) 47. Apparatus and Plant Equipment (Vol. 76-80) 48. Unit Operations and Processes (Vol. 76-80) 77. Electrochemistry (Vol. 76-80)	47. Apparatus and Plant Equipment 48. Unit Operation and Processes 77. Electrochemistry
53. Mineralogical and Geological Chemistry	53. Mineralogical and Geological Chemistry	53. Mineralogical and Geological Chemistry
54. Extractive Metallurgy	54. Extractive Metallurgy	54. Extractive Metallurgy
55. Ferrous Metals and Alloys	55. Ferrous Metals and Alloys	55. Ferrous Metals and Alloys
56. Nonferrous Metals and Alloys	56. Nonferrous Metals and Alloys	56. Nonferrous Metals and Alloys
57. Ceramics	57. Ceramics	57. Ceramics
58. Cement, Concrete, and Related Building Materials	58. Cement and Concrete Products	58. Cement and Concrete Products

11CI- 14CI Period Section 1982-2001	10CI and 9CI Period Section 1972-1981	8CI Period Section 1976-1971
59. Air Pollution and Industrial Hygiene	59. Air Pollution and Industrial Hygiene	59. Air Pollution and Industrial Hygiene
60. Waste Treatment and Disposal	60. Sewage and Wastes	60. Sewage and Wastes
61. Water	61. Water	61. Water
62. Essential Oils and Cosmetics	62. Essential Oils and Cosmetics	62. Essential Oils and Cosmetics
63. Pharmaceuticals	63. Pharmaceuticals	63. Pharmaceuticals
64. Pharmaceutical Analysis	64. Pharmaceutical Analysis	64. Pharmaceutical Analysis
65. General Physical Chemistry	65. General Physical Chemistry	65. General Physical Chemistry
66. Surface Chemistry and Colloids	66. Surface Chemistry and Colloids	66. Surface Chemistry and Colloids
67. Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms	67. Catalysis and Reaction Kinetics	67. Catalysis and Reaction Kinetics
68. Phase Equilibria, Chemical Equilibria, and Solutions	68. Phase Equilibria, Chemical Equilibria, and Solutions	68. Phase Equilibria, Chemical Equilibria, and Solutions
69. Thermodynamics, Thermochemistry, and Thermal Properties	69. Thermodynamics, Thermochemistry, and Thermal Properties	69. Thermodynamics, Thermochemistry, and Thermal Properties)
70. Nuclear Phenomena	70. Nuclear Phenomena (Vol. 82-95) 75. Nuclear Phenomena (Vol.76-81)	75. Nuclear Phenomena
71. Nuclear Technology	71. Nuclear Technology (Vol.82-95) 76. Nuclear Technology (Vol. 76-81)	76. Nuclear Technology
72. Electrochemistry	72. Electrochemistry (Vol. 82-95) 77. Electrochemistry (Vol.76-81)	77. Electrochemistry

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1982-2001****10CI and 9CI Period Section
1972-1981****8CI Period Section
1976-1971**73. Optical, Electron,
and Mass Spectroscopy
and Other Related
Properties**73. Spectra by Absorption,
Emission, Reflection,
or Magnetic Resonance,
and Other Optical
Properties****73. Spectra and Other
Optical Properties**
(Vol. 66-71);
**Spectra by Absorption
Emission, Reflection,
or Magnetic Resonance
and Other Optical
Properties**
(Vol.72-75)74. Radiation Chemistry,
Photochemistry, and
Photographic and Other
Reprographic Processes74. Radiation Chemistry,
Photochemistry, and
Photographic Processes74. Radiation Chemistry,
Photochemistry, and
Photographic Processes75. Crystallography
and Liquid
Crystals**75. Crystallization and
Crystal Structure**
(Vol. 82-95)
**70. Crystallization and
Crystal Structure**
(Vol.76-81)**70. Crystallization and
Crystal Structure**76. Electric
Phenomena**76. Electric Phenomena)**
(Vol.82-95)
71. Electric Phenomena
(Vol.76-81)**71. Electric Phenomena**77. Magnetic
Phenomena**77. Magnetic Phenomena**
(Vol.82-95)
72. Magnetic Phenomena
(Vol.76-81)**72. Magnetic Phenomena**78. Inorganic Chemicals
and Reactions78. Inorganic Chemicals
and Reactions78. Inorganic Chemicals
and Reactions79. Inorganic Analytical
Chemistry79. Inorganic Analytical
Chemistry79. Inorganic Analytical
Chemistry80. Organic Analytical
Chemistry80. Organic Analytical
Chemistry80. Organic Analytical
Chemistry