

## Chemical Abstracts as a Source for Newly Published Books in Chemistry and Chemical Engineering

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*Chemical Abstracts* (CA) as a convenient source for information on newly published books in chemistry and chemical engineering is examined by discussing how such information can be searched through CA indexes or an online computer search of the Chemical Abstracts Service (CAS) data base. A specialized current-awareness bulletin is also described. Other topics discussed include coverage and general growth of book literature in CA and growth of book literature in selected subject areas in particular.

### INTRODUCTION

As knowledge about different aspects of a subject discipline increases over a period of time, findings are published as journal articles, patents, or other communications. Books, reviews, and bibliographies soon follow in an attempt to collect and classify some of the more interesting and important information about the subject. These books or reviews contain little original work and often are based entirely on previously published information. In view of the ever increasing size of chemical literature, it is not surprising that book literature in chemistry and chemical engineering has also increased rapidly.

The volume of scientific book literature being published makes it a continual challenge for scientists to keep informed of new books or book-related information in their fields. Scanning the "Book Review" or "Books Received" sections of scientific journals and reviewing publishers' annual catalogs and monthly bibliographies can be time-consuming, unrewarding, and costly. One convenient source for such information is the Chemical Abstracts Service (CAS) data base, which contained information on more than 6300 books and book-related publications in chemistry and chemical engineering in 1980 alone. Titles and bibliographic information on books can be found in all 80 subject sections of *Chemical Abstracts* (CA). Coverage ranges from authored monographs and edited conference proceedings to textbooks, encyclopedias, and chemical dictionaries published worldwide.

This paper details how use of CA can improve current awareness of newly published books in specific areas of chemistry. It describes a typical CA book announcement and examines the coverage of various types of documents broadly described by the term "book". It illustrates how users can obtain information on new books from the CAS data base through various CA indexes, online searches of CAS computer-readable files, and a specialized current-awareness bulletin. The paper also surveys the growth of book publications in a number of selected subject areas and provides a historical account of book coverage in CA.

### BOOK ANNOUNCEMENTS IN CA

A typical book announcement in CA begins with the title of the book in English. For books written in foreign languages, the actual or transliterated foreign-language title is given. Then follow the names of the author or editor, the publisher, the year of publication, and the number of pages. The original language of the book and its price, when known, are also

provided. If the book is a translation from a different language, it is so indicated.

Nonprint works such as motion pictures, sound recordings, video recordings, and microforms are processed similarly. The format is modified to provide information appropriate to each medium. For example, an announcement would include the number of frames and size for a filmstrip, the number of reels and time for a motion picture, and the number of cassettes and time for a sound recording. The size and number of slides or fiche are also indicated when possible. Some typical examples for books (A) and other nonprint media (B) appear in Figure 1.

In CA, book announcements are assigned to the appropriate section by subject. They are placed directly after the abstracts of journal articles and are set off by dashes so that a user can easily find the books listed in any section of interest. However, users searching many subject areas can more quickly locate announcements of specific interest by using the variety of CA indexes.

### BOOK COVERAGE IN CA

To obtain book information most efficiently from the CAS data base, the user needs to know the scope of book coverage, how book information is processed, and what exactly is available for search in a typical book announcement.

Coverage of literature in CA under the category "books" is much more comprehensive than the traditional sense of the word would indicate. It includes documents considered to be books by some and collections of articles by others as well as nonprint materials. The types of literature covered are shown in Figure 2. They fall into three main categories: documents traditionally considered books, such as monographs, textbooks, handbooks, biographies, and manuals; edited publications appearing as books, such as conference proceedings and encyclopedias; nonprint materials, such as motion pictures, video recordings, microfilms, and cassette tapes.

Books are covered two ways in CA. They are divided into documents for which book announcements alone are prepared and those for which an announcement is prepared in addition to abstracts for individual articles which are selected for coverage in CA. The latter treatment applies to documents that appear in book form but are a collection of articles written by individual authors and edited by one or more editors. An edited conference proceedings, either in monographic or serial form, consists of a number of papers presented at a meeting. Each paper is individually authored but the book as a whole

## (A) Print Media

93: 58038e **Solar Flares. A Monograph from Skylab Solar Workshop II.** Sturrock, Peter A.; Editor (Colorado Associated University Press: Boulder, Colo.). 1980. 513 pp. (Eng).

93: 58039f **Principles of Quantum Electronics.** Marcuse, Dietrich (Academic Press: New York, N. Y.). 1980. 494 pp. (Eng).

93: 58040z **Proceedings of the 24th All-Union Conference on Luminescence.** (Tezisy 24go Vsesoyuznogo Soveshchaniya po Lyuminesentsii) Kunetsov, V. V.; Editor (Akad. Nauk Beloruss. SSR, Inst. Fiz.: Minsk, Beloruss. SSR.). 1977. 217 pp. (Russ) rub 0.77.

93: 60508b **Atomic Spectral Analysis, Pt. 2.** (Genshi Supekutoru Bunseki, (Ge)) Ishibashi, Masayoshi; Editor (Maruzen: Tokyo, Japan). 1979. 415 pp. (Japan) ¥ 9,500.

93: 54549z **Material Science.** (Werkstoffkunde) Bargel, Hans Juergen; Schulze, Guenter; Editors (Hermann Schroedel: Hannover, Fed. Rep. Ger.). 1978. 368 pp. (Ger).

## (B) Nonprint Media

93: 12550n **Chemicals - a Matter of Balance [with Special Reference to Safety Measures].** Monsanto Company (Modern Talking Picture Service: St. Petersburg, Fla.). 1979. Motion Picture; 13 minutes; reel (Eng).

93: 7647v **Preparation of Diethyl n-Butylmalonate.** Hirschberg, Albert (Prentice-Hall Media: Tarrytown, N. Y.). 1978. Filmstrip; 67 frames; 35 mm. (Eng).

93: 39251c **Toxicology of Cholinesterase-Inhibiting Insecticides.** Morgan, Donald P. (National Audiovisual Center: Washington, D. C.). 1979. Slide; 53 slides; cassette (Eng).

93: 34824g **ESCA [Electron Spectroscopy for Chemical Analysis] and Auger Spectroscopy.** Hercules, David M. (American Chemical Society: Washington, D. C.). 1978. Sound Recording; 375 minutes; 6 cassettes (Eng).

Figure 1. Examples of book announcements in CA.

	AB*	AB+A*
<b>Books</b>		
Authoried Monographs (≥ 49 pp.)	X	
Bibliographies	X	
Biographies	X	
Dictionaries	X	
Festschrift	X	X
Handbook	X	
Manuals	X	
New Editions (2nd, 3rd, etc.)	X	X
Reference Publications	X	
Reprints (even if < 49 pp.)	X	
Reviews	X	
Textbooks	X	
Translations	X	
Unnumbered Serials	X	
<b>Edited Publications</b>		
Conference Proceedings		
(Published within Serials)	X	X
Conference Publications	X	X
Edited Monographs	X	X
Encyclopedias	X	
Publisher's Series	X	X
<b>Nonprint Media</b>		
Microforms	X	X
Motion Pictures	X	
Sound Recordings	X	
Video Recordings	X	

\* A = abstracts for individual articles  
AB = book announcements

Figure 2. Documents covered in CA as books and the type of coverage.

usually has a different editor. If individual articles are considered suitable for inclusion in CA, they are abstracted, citing

CA Section 6  
General Biochemistry

- (A) 93: 109410e **Advances in Experimental Medicine and Biology, Vol. 129: Aging Phenomena: Relationships among Different Levels of Organization.** Oota, Kunio; Makinodan, Takashi; Iriki, Masami; Baker, Lynn S.; Editors (Plenum Press: New York, N. Y.). 1980. 317 pp. (Eng).

CA Section 2  
Hormone Pharmacology

- (B) 93: 125882r **Interaction of hormones with receptors and alterations of these processes with age.** Roth, George (Gerontol. Res. Cent., Baltimore, MD USA). *Adv. Exp. Med. Biol.* 1980, 129(Aging Phenom.: Relat. Differ. Levels Organ.), 157-69 (Eng). A review with 8 refs.

CA Section 13  
Mammalian Biochemistry

- (C) 93: 111032b **Aging of hepatocytes.** Shima, Akihiro (Dep. Exp. Radiol., Shiga Univ. Med. Sci., Shiga, Japan 520-21). *Adv. Exp. Med. Biol.* 1980, 129(Aging Phenom.: Relat. Differ. Levels Organ.), 59-70 (Eng). A review with 21 refs. of the age-related changes in DNA polyploidy in hepatocytes of the mouse, fish (*Oryzias latipes*), and house shrew (*Suncus murinus*).
- (D) 93: 111033c **Aging and changes in genetic information.** Hart, R. W.; Modak, S. P. (Coll. Med., Ohio State Univ., Columbus, OH 43210 USA). *Adv. Exp. Med. Biol.* 1980, 129(Aging Phenom.: Relat. Differ. Levels Organ.), 123-37 (Eng). A review with 102 refs.
- (E) 93: 111034d **Translational activity and fidelity of purified ribosomes from aging mouse livers.** Mori, Nozumi; Mizuno, Denichi; Goto, Sataro (Fac. Pharm. Sci., Univ. Tokyo, Tokyo, Japan). *Adv. Exp. Med. Biol.* 1980, 129(Aging Phenom.: Relat. Differ. Levels Organ.), 151-6 (Eng). A review with 16 refs.
- (F) 93: 146797g **Mechanism of age-dependent decrease in sulfation of chondroitin sulfate.** Murota, Seitsuo; Honda, Atsushi; Abe, Midori; Mori, Yo (Dep. Pharmacol., Tokyo Metrop. Inst. Gerontol., Tokyo, Japan 173). *Adv. Exp. Med. Biol.* 1980, 129(Aging Phenom.: Relat. Differ. Levels Organ.), 39-46 (Eng). A review with 25 refs.

CA Section 14  
Mammalian Pathological Biochemistry

- (G) 93: 111620s **Hypertension, vasculature and aging.** Ooshima, Akira; Yamori, Yukio (Dep. Pathol., Shimane Med. Univ., Izumo, Japan 693). *Adv. Exp. Med. Biol.* 1980, 129(Aging Phenom.: Relat. Differ. Levels Organ.), 99-110 (Eng). A review with 16 refs.
- (H) 93: 112014j **Aging of in vivo cartilage cell.** Igarashi, Mitsuo; Hayashi, Yasufumi (Dep. Orthop. Surg., Tokyo Metrop. Geriatr. Hosp., Tokyo, Japan). *Adv. Exp. Med. Biol.* 1980, 129(Aging Phenom.: Relat. Differ. Levels Organ.), 111-22 (Eng). The pepsin soly. of collagen from cartilage of aged persons was less than that of collagen from cartilage of younger adults; the no. of aldimine cross-links of the pepsin insol. collagen was higher in the aged cartilage, and the type of collagen was changed. No quant. and qual. changes of glycosaminoglycans with aging were found. The pepsin soly. of aged osteoarthritic and rheumatoid arthritic cartilage was higher than that for normal aged cartilage. Hyaline cartilages from fibrillated and osteophytic areas contained 2 types of collagen. The ratio of type I collagen to type I plus type II collagens in fibrillated cartilage was not lower than that for the other pathol. cartilage.

Figure 3. A book announcement for an edited monograph and corresponding abstracts for selected articles.

the authors. Editors are identified only in book announcements. Figure 2 shows the types of documents processed as book announcements alone and those given dual coverage.

The dual coverage of edited publications is illustrated in Figure 3. The typical announcement A for the book "Advances in Experimental Medicine and Biology, Vol. 129: Aging Phenomena: Relationships among Different Levels of Organization", edited by K. Oota, T. Makinodan, M. Iriki,

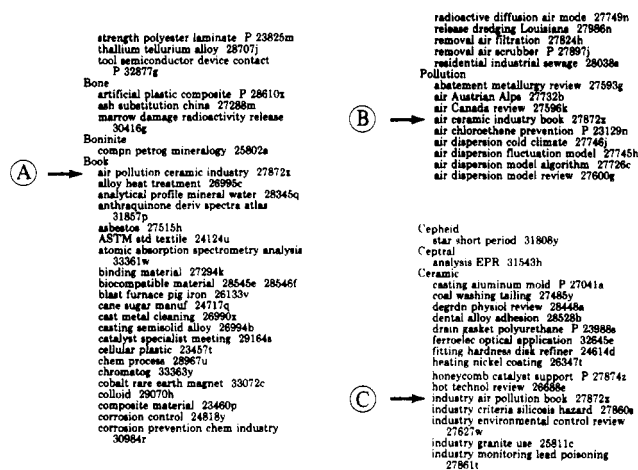


Figure 4. Keyword Index entries for the book "Air Pollution from Ceramic Industry".

and L. S. Baker, appears in CA Section 6—General Biochemistry. However, seven individually authored articles were selected from the book for inclusion in other sections of CA. These articles were processed just like journal articles, i.e., abstracted and placed in appropriate CA sections as shown: abstract B in CA Section 2—Hormone Pharmacology, abstracts C, D, E, and F in CA Section 13—Mammalian Biochemistry, and abstracts G and H in CA Section 14—Mammalian Pathological Biochemistry.

Book announcements are similarly prepared for conference proceedings published within serials when the editor of the proceedings is different from the editor of the serial.

#### SEARCHING THROUGH CA INDEXES

For current-awareness purposes, the user may find the CA Keyword Index helpful. This natural language index provides quick access points to pertinent book announcements. The keyword entries include such terms as "book", "filmstrip", and "tape cassette". Since every significant term in a keyword phrase becomes an index heading in the Keyword Index, it is convenient to search for these types of documents in the index. They appear at their own heading A (see Figure 4 for keyword entries for the heading "Book") so that all book announcements of interest in a given medium can be scanned in a CA issue within a matter of minutes. Access to a book announcement can also be made through headings for a particular subject as indicated in Figure 4. For example, keyword index entries B at "Pollution" and C at "Ceramic" correspond to the same entry A at "Book".

The Volume or the Collective Indexes may be used for a more comprehensive search. These indexes use strictly controlled chemical nomenclature and subject heading vocabulary and provide more selective access to the original documents than does the Keyword Index. The Volume Indexes are published semiannually and the Collective Indexes now appear every 5 years. Of these indexes, the General Subject and the Chemical Substance Indexes are the most useful for searching for book information. The former provides access to book titles which refer in a general way to subjects or classes of substances. The latter allows users to find books containing information on specific chemical compounds. Index entries for the book "Air Pollution from Ceramic Industry" discussed above are found in the General Subject Index (see Figure 5) at the headings "Air pollution" (D) and "Ceramic industry" (E) and not at the heading "Books". The heading "Books" (F) is used in the General Subject Index for books in general, not individual books, as shown in Figure 5. An abstract number associated with an index entry from a book announcement is always preceded by the letter "B". This pro-

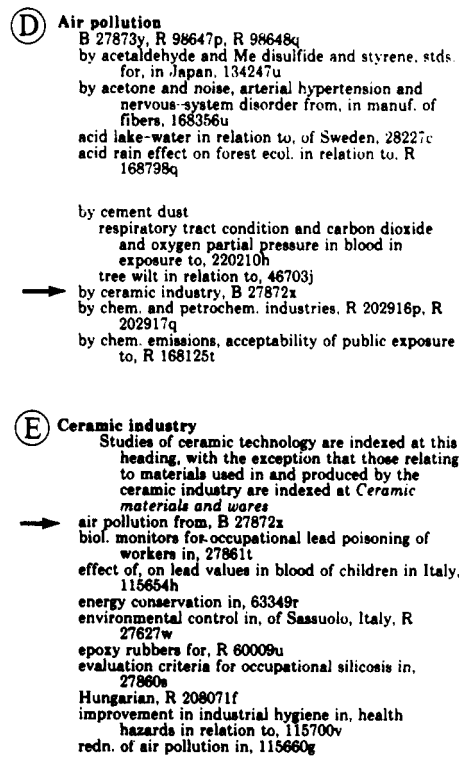


Figure 5. General Subject Index entries for the book "Air Pollution from Ceramic Industry".

cessing feature of using letters to designate publication types, e.g., "P" for patents and "R" for reviews, is valuable for machine searching as these letters can prove to be extremely effective search terms. The use of the various indexes as access points for CA has been described in greater detail elsewhere.<sup>1</sup>

#### ONLINE SEARCH

Recently it has become possible for scientists, engineers, and information specialists without large computer facilities to search data bases in many disciplines through online search systems offered by vendors. Three such vendors in the U.S., DIALOG Information Retrieval Service, Bibliographic Retrieval Service, and System Development Corporation, offer CAS's CA SEARCH. This computer-readable file contains CA Volume Index entries, Keyword Index entries, and bibliographic citations. The CA SEARCH files as offered by DIALOG contain the complete abstract heading (titles of papers, patents, and reports; names of authors, patent assignees, and patentees; full bibliographic citations), CA section and subsection numbers, publication type, CODEN, descriptors, and identifiers. Descriptors correspond to controlled-vocabulary CA General Subject Index headings. Identifiers are derived from uncontrolled vocabulary index terms, such

(A) ? S BOOK; S COAL; S GASIFICATION  
 ▶ 1 7285 BOOK  
 ▶ 2 4781 COAL (SEE ?IGNOTE)  
 ▶ 3 1227 GASIFICATION  
 ? COMBINE 1 AND 2 AND 3  
 ▶ 4 8 1 AND 2 AND 3  
 ? TYPE 4/6/1-8

4/6/1  
 93875465 CA09308075465J PUBL: 78 PAGES: 263 pp.  
 ▶ GEOLOGY, GROUNDWATER HYDROLOGY, AND HYDROGEOCHEMISTRY OF A PROPOSED  
 SURFACE MINE AND LIGNITE GASIFICATION PLANT SITE NEAR DUNN CENTER, NORTH  
 DAKOTA

4/6/2  
 93010572 CA09302010572X PUBL: 79 PAGES: 324 pp.  
 ▶ KINETICS OF COAL GASIFICATION: A COMPILATION OF RESEARCH

4/6/3  
 92217788 CA09226217788X PUBL: 79 PAGES: 190 pp.  
 ▶ THREE CLEAN FUELS FROM COAL: TECHNOLOGY AND ECONOMICS: SYNTHETIC  
 NATURAL GAS, METHANOL, MEDIUM BTU GAS

4/6/4  
 92217787 CA09226217787W PUBL: 79 PAGES: 196 pp.  
 ▶ SYNTHETIC FUELS FROM COAL: STATUS AND OUTLOOK OF COAL GASIFICATION AND  
 LIQUEFACTION

4/6/5  
 92166226 CA09220166226G PUBL: 79 PAGES: 257 pp.  
 ▶ AMERICAN CHEMICAL SOCIETY SYMPOSIUM SERIES, NO. 110: COAL CONVERSION  
 TECHNOLOGY. PROBLEMS AND SOLUTIONS

92166166 CA09220166166H JOURNAL: REPORT PUBL: 77 ISSUE:  
 FE-1734-45(VOL.11)(BK.3), PAGES: 119 pp.  
 ▶ CARBON DIOXIDE ACCEPTOR PROCESS GASIFICATION PILOT PLANT. VOLUME 12.  
 BOOK 3 of 4

4/6/7  
 92165917 CA09220165917S JOURNAL: REPORT PUBL: 77 ISSUE:  
 FE-1734-45(VOL.12)(BK.2), PAGES: 215 pp.  
 ▶ CARBON DIOXIDE ACCEPTOR PROCESS GASIFICATION PILOT PLANT. VOLUME 12.  
 BOOK 2 OF 4

4/6/8  
 92131835 CA09216131835Y PUBL: 79 PAGES: 324 pp.  
 ▶ KINETICS OF COAL GASIFICATION. A COMPILATION OF RESEARCH BY THE LATE DR.  
 JAMES LEE JOHNSON

? TYPE 4/2/8

(B) 4/2/8  
 92131835 CA09216131835Y  
 KINETICS OF COAL GASIFICATION. A COMPILATION OF RESEARCH BY THE LATE DR.  
 JAMES LEE JOHNSON  
 INSTITUTE OF GAS TECHNOLOGY  
 LOCATION: USA  
 SECTION: CA051001, CA067XXX PUBL CLASS: BOOK  
 ▶ CODEN: BOOKA7 PUBL: 79 PAGES: 324 pp.  
 PUBLISHER: (JOHN WILEY AND SONS ADDRESS: NEW YORK, N. Y.)  
 PRICE: \$23.50  
 IDENTIFIERS: BOOK COAL GASIFICATION KINETICS, FUEL GAS MANUF COAL BOOK

Figure 6. Online search for books on coal gasification in computer-readable CA SEARCH files.

as CA Keyword Index or index modifications from the Volume Indexes. Specific chemical substances are represented by CAS Registry Numbers.

In the sample online search conducted on DIALOG's file 4 (CA SEARCH, from 1980 to date), books on coal gasification were searched. Combining the terms "coal" and "gasification" with "book" retrieved eight citations, all of which were pertinent as seen from their titles (A) in Figure 6.

Two types of bibliographic information that are unique to book citations are particularly useful in searching for a wide variety of book information. These are publication type and CODEN, as shown in example B in Figure 6. Books are uniquely identified by the word "Book" in the Publication Class field and by the designation "BOOKA7" in the CODEN field. Using "book" as a general term in a search profile may retrieve some irrelevant hits such as "book binding" or "book preservation", but specifying it as being in the publication class data field will retrieve only relevant hits. Similarly, the CODEN "BOOKA7" will retrieve only documents which are actually classified as books. However, the user should be cautious in using the publication class as a search term in an online search, as the exact format of the term may vary from vendor to vendor or even from file to file offered by the same vendor.

Searching for information through CA indexes or by means of an online search is simple and fast when the user's interest is narrow and the information is sought on a one-time basis. However, when a user has a continuing interest in a broad area, search strategies can be considerably more difficult to formulate and searches more time-consuming. Consequently,

Table I. Growth of Book Announcements in CA

Year	Vol.	Books
1907	1	
1908	2	97
1909	3	198
1910	4	785
1911	5	776
1912	6	535
1913	7	659
1914	8	727
1915	9	622
1916	10	324
1917	11	344
1918	12	524
1919	13	542
1920	14	1,275
1921	15	975
1922	16	886
1923	17	1,059
1924	18	1,036
1925	19	671
1926	20	1,036
1927	21	582
1928	22	1,046
1929	23	1,344
1930	24	1,169
1931	25	1,546
1932	26	1,380
1933	27	1,963
1934	28	1,375
1935	29	1,579
1936	30	1,809
1937	31	1,697
1938	32	1,496
1939	33	1,801
1940	34	1,421
1941	35	1,330
1942	36	833
1943	37	1,673

Year	Vol.	Books
1944	38	1,766
1945	39	1,491
1946	40	825
1947	41	902
1948	42	1,127
1949	43	1,439
1950	44	1,539
1951	45	1,959
1952	46	1,543
1953	47	1,912
1954	48	1,926
1955	49	1,732
1956	50	2,037
1957	51	1,498
1958	52	1,274
1959	53	1,756
1960	54	2,096
1961	55	2,307
1962	56,57	2,716
1963	58,59	4,148
1964	60,61	2,082
1965	62,63	2,088
1966	64,65	3,557
1967	66,67	3,046
1968	68,69	2,753
1969	70,71	2,552
1970	72,73	2,728
1971	74,75	3,444
1972	76,77	3,104
1973	78,79	2,611
1974	80,81	2,953
1975	82,83	6,291
1976	84,85	5,744
1977	86,87	6,637
1978	88,89	7,804
1979	90,91	7,378
1980	92,93	6,399

there is a need for services that take less time and are more economical.

#### CA SELECTS—"NEW BOOKS IN CHEMISTRY"

A valuable source for information about books in chemistry and chemical engineering is "New Books in Chemistry", one of CAS's *CA Selects* series of current-awareness bulletins (see Figure 7). Published every 2 weeks, this bulletin collects in one place all the book announcements that appear in CA for the corresponding period.

"New Books in Chemistry" is subdivided for easy scanning into six different headings: Biochemistry; History, Education, and Documentation; Organic Chemistry; Macromolecular Chemistry; Applied Chemistry and Chemical Engineering; Physical and Analytical Chemistry. In 1980, 6399 book citations were published in this bulletin. The timeliness of the biweekly issues coupled with low subscription cost makes it and the other 122 topics in the *CA Selects* series especially attractive for individuals, small companies, and other institutions with limited funds allocated for their information needs.

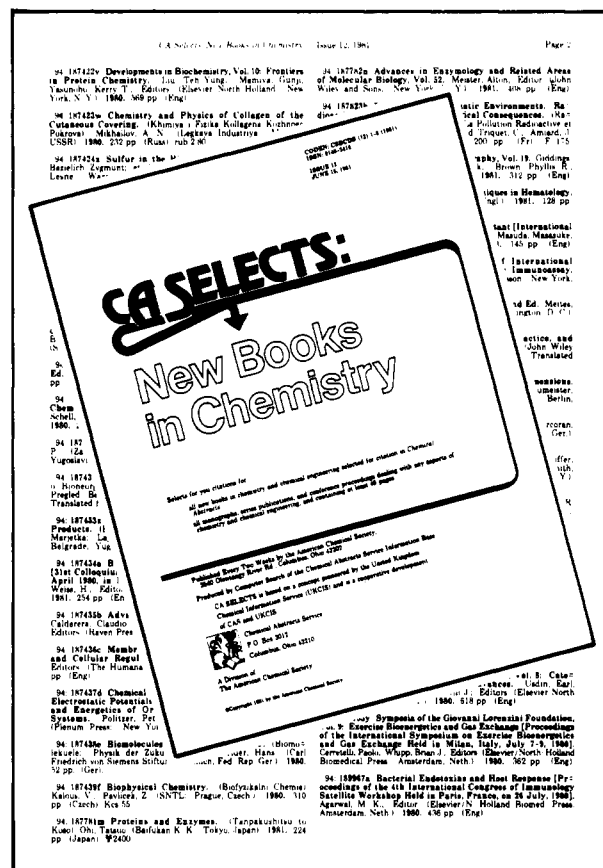
#### GROWTH OF BOOK LITERATURE IN CA

Book announcements have appeared as a regular part of CA almost from its inception. Data in Table I show that they have grown from barely 100 in 1908 to over 7800 in 1978. Book announcements per year averaged approximately 500 during the period 1908–1919, 1400 during the period 1920–1954, 2200 during the period 1955–1964, and 2800 during the period 1965–1974. In 1975, CA published 6300 book announcements representing an increase of 110% over 1974. This unusually large increase for a single year was due to a great extent to improvements in the processing system which made it possible to move more documents through the system faster than in previous years. Book citations have averaged over 6700 a year for the 1975–1980 period.

The language distribution of book literature almost parallels the language of publication of journal literature abstracted in CA for the same year. For example, in 1978 the languages of publication of new books announced in CA were as follows: English, 55%; Russian, 25%; German, 9%, French, 2%; Jap-

SUBJECT	CA SECTION NUMBER AND TITLE
Ecology and Environment	4: Toxicology 17: Foods 19: Fertilizers, Soils and Plant Nutrition 53: Mineralogical and Geological Chemistry 59: Air Pollution and Industrial Hygiene 60: Sewage and Wastes 61: Water
Energy	50: Propellants and Explosives 51: Fossil Fuels, Derivatives, and Related Products 52: Electrochemical, Radiational, and Thermal Energy Technology 69: Thermodynamics, Thermochemistry, and Thermal Properties 70: Nuclear Phenomena 71: Nuclear Technology 72: Electrochemistry
Plastics and Elastomers	35: Synthetic High Polymers 36: Plastics Manufacturing and Processing 37: Plastics Fabrication and Uses 38: Elastomers, Including Natural Rubber
Metals	54: Extractive Metallurgy 55: Ferrous Metals and Alloys 56: Nonferrous Metals and Alloys

To examine the relative growth of book literature, four subject areas of current interest were studied: Ecology and Environment, Energy, Plastics and Elastomers, and Metals. Each of these subjects encompasses a number of CA sections as shown in Table II. Total book announcements and abstracts of all documents (papers, patents, books, and other documents) for these selected subjects were tabulated for the



As might be expected, the intense interest of the scientific community in environment/ecology and energy in the 1970s is reflected in the increased number of papers, patents, and books published during this period. While the total abstracts of all documents on ecology and environment increased from 32 000 in 1972 to over 62 000 in 1980, an increase of 94%, the number of books published in this field grew almost 300%. An increase of over 200% in the number of books published on energy was also observed. However, book literature in metallurgy, plastics, and elastomers shows different patterns of growth. In metallurgy, the pattern is one of steady but un-

YEAR	VOL.	ECOLOGY AND ENVIRONMENT		ENERGY		PLASTICS AND ELASTOMERS		METALS	
		BOOK ANN.	ABSTR. OF ALL DOCUMENTS	BOOK ANN.	ABSTR. OF ALL DOCUMENTS	BOOK ANN.	ABSTR. OF ALL DOCUMENTS	BOOK ANN.	ABSTR. OF ALL DOCUMENTS
1972	76-77	445	32266	285	33089	215	22385	258	17002
1973	78-79	304	34551	233	31196	158	18559	242	16998
1974	80-81	502	36080	237	31984	99	22168	230	21770
1975	82-83	966	40100	617	38353	290	27439	390	19800
1976	84-85	773	45186	525	34552	207	24492	292	27161
1977	86-87	1066	49809	635	41921	207	22087	417	24530
1978	88-89	1322	57057	767	42583	245	21642	425	26746
1979	90-91	1336	53923	844	49708	252	21060	446	26373
1980	92-93	1182	62465	677	52051	209	23049	318	26298

spectacular growth. On the other hand, books published on plastics and elastomers did not increase, reflecting a constant level of interest in polymers in the 1970s, down from the explosive growth of this field in the 1950s and 1960s.

### CONCLUSION

Book literature in chemistry and chemical engineering continues to show increased growth. Renewed scientific activity in any chemical discipline is accompanied by an increase not only in journal article and patent literature but also in book literature in that field. Thus, it is a constant challenge to be currently aware of newly published books and reference treatises in one's field of specialization. A convenient source

for such information is *Chemical Abstracts*, which covers 6000 book and book-related publications in chemistry and chemical engineering each year. The information can be obtained in a variety of forms and formats to suit the individual needs of the user.

### REFERENCES AND NOTES

- (1) "CAS Printed Access Tools 1981 Edition"; American Chemical Society: Columbus, OH, 1981.
- (2) "CAS Today, Facts and Figures About Chemical Abstracts Service"; American Chemical Society: Columbus, OH, 1980.
- (3) "Subject Coverage and Arrangement of Abstracts by Section in *Chemical Abstracts*"; American Chemical Society: Columbus, OH, 1975.

## Searches for Polymers in the BASIC Files Derived from the Chemical Abstracts Service Chemical Registry System<sup>†</sup>

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The methods used for searching the BASIC Substructure Search System for polymers containing specified monomers are described. The BASIC files are based on CAS Registry and REG/CAN data. The searches yield Registry Numbers which are then used to retrieve CA Abstract Numbers.

### INTRODUCTION

The Chemical Abstracts Service (CAS) Chemical Registry System<sup>1</sup> contains more than 5 000 000 chemical structures that have been cited in the literature and in *Chemical Abstracts* (CA) indexes since 1965. The file is increasing at the rate of about 350 000 structures per year. The use of this file, as installed at BASIC, for substructure search has been described previously.<sup>2,3</sup> We now report batch search retrieval of polymers of given monomers from the BASIC Substructure Search Files, which contain 170 000 polymers.

Since the structures of polymers are seldom completely regular, polymers are registered by CAS on the basis of their monomers,<sup>4,5</sup> as illustrated in Figure 1. Polymers only registered on the basis of their structural repeating units<sup>5</sup> are not yet retrievable from the BASIC files, so this paper is restricted to describing searches for monomer-based polymer records.

### BASIC SEARCH FILES

Five BASIC Substructure Search Files have been generated from CAS data, as shown in Figure 2. They are used in various combinations for batch retrieval of polymers, depending on the type of search.

**Connection Table File.** The CAS Chemical Registry Structure Standard Distribution Format (SDF) File<sup>6</sup> contains, among other data, the connection table for each monomer for every polymer record in which it occurs. To optimize searching, monomer connection tables are stored only once in the Connection Table File;<sup>3</sup> i.e., only those CAS Chemical Registry System data elements that are necessary for the BASIC Substructure Search System are included. This file is used for the generation of the Fragment Mask File and for iterative (atom-by-atom) topological searches.

**Fragment Mask File.** The BASIC Fragment Mask File contains all BASIC Fragment numbers for each Registry Number in the form of a bit string.<sup>2</sup> The file is used as an efficient screen prior to searching the Connection Table File.

**Multicomponent Registry Number File.** This was generated as an additional file for batch retrieval of multicomponent compounds, such as polymers. Each polymer entry contains the Registry Number of the polymer and each monomer as well as an indication of the total number of Registry Numbers. The record for a homopolymer therefore contains the Registry Number of the homopolymer, the Registry Number of the monomer, and the number 2 indicating two Registry Numbers. The record for acrylonitrile-1,3-butadiene copolymer is shown in the following example.

total	copolymer	CH <sub>2</sub> =CH-CH=CH <sub>2</sub>	CH <sub>2</sub> =CH-CN
3	9003-18-3	106-99-0	107-13-1

It is clear from the record description that the homopolymer and all copolymers of, for example, acrylonitrile can be retrieved by means of the Registry Number of the monomer.

**Link File.** For a further simplification of the searches, the Registry Number data of the Multicomponent Registry Number File are divided into multicomponent-component Registry Number pairs and are sorted in component Registry Number order. This procedure is illustrated for polymers in Figure 3 with acrylonitrile homopolymer and acrylonitrile-1,3-butadiene copolymer.

**REG/CAN File.** This file contains all CAS Registry Number-CA Abstract Number pairs and therefore all polymer Registry Number-CA Abstract Number pairs.

### SEARCH PROCEDURE FOR POLYMERS

The simplest way to retrieve polymers, as already mentioned, is through the monomers by searching either the CA indexes or the BASIC Substructure Search Files. The search pro-

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