

Advanced Subject Search Techniques in CAplusSM

September 2009



At the end of this workshop, you will be able to

- Develop comprehensive subject search strategies in CAplusSM
- Use the CA Lexicon to enhance search results
- Refine search results using specialized indexes which contain thesauri

Before you begin

This workshop is designed for the information professional who needs to enhance their subject search skills in CAplus. It is designed for the searcher who is skilled in using STN[®] commands and who has a basic understanding of the content of CAplus.

Copyright © September 2009 American Chemical Society
All Rights Reserved

Printed in the USA

QUOTING OR COPYING OF MATERIAL FROM THIS PUBLICATION
FOR EDUCATIONAL PURPOSES IS ENCOURAGED, PROVIDED
ACKNOWLEDGMENT IS MADE OF THE SOURCE OF SUCH MATERIAL.

Table of Contents

Overview

Searching CAplus	3
Database Content from 1907-Present	4
Indexing the pre-1967 data	4
Fully indexed records.....	5
Work in progress records.....	9
Pre-1967 records partially indexed with subject indexing.....	9
Nonindexed records	11
Skills Practice.....	12
The CA Lexicon.....	13
Applications of the CA Lexicon	13
General subject index terms.....	13
Taxonomic indexing terms	15
Substance class index terms.....	17

Thesaurus Tools

Online Thesauri.....	21
CAplus Thesauri	21
Develop a Controlled-Term Strategy.....	22
Verify the Term.....	22
View the Hierarchy	23
Search the Controlled Terminology.....	24
CA Lexicon relationship codes.....	25
Develop a Basic Index Strategy	26

Enhance Subject Search Results

Improve Basic Index Search Results	29
Review Index Terms in Answer Sets.....	30
Preliminary Basic Index search	30
Additional terms identified	31
Access the CA Lexicon for Key Terminology	32
Step 1: Verify the term is in the database	33
Step 2: View the hierarchy of associated controlled terminology	33
Verify the terminology for sagebrush.....	36
Step 3: Search the controlled terminology.....	37
Step 4: Display results	42
Display in more complete detail	44

Skills Practice.....	45
Analyze Controlled Terminology	46
Preliminary Basic Index search	46
Step 1: Rearrange the answer set in relevance order	47
Step 2: Extract the controlled terminology from the most relevant answers	47
Step 3: View the hierarchy of associated controlled terminology for each term.....	48
Step 4: Search the controlled terminology	50
Step 5: Display results	51

Refinement Techniques

Refinement Techniques	55
International Patent Classification Codes	56
Search with IPCs.....	56
Step 1: Refine the answer set to patents only	57
Step 2: Identify the “correct” IPC code	57
Step 3: Verify the IPC code	59
Step 4: Refine using the IPC code	61
CA Section Codes	62
Search with CA Section Codes	62
Step 1: Identify the “correct” CA section code.....	63
Step 2: Verify the CA section code.....	64
Step 3: Refine using the CA section code.....	68
Skills Practice.....	69

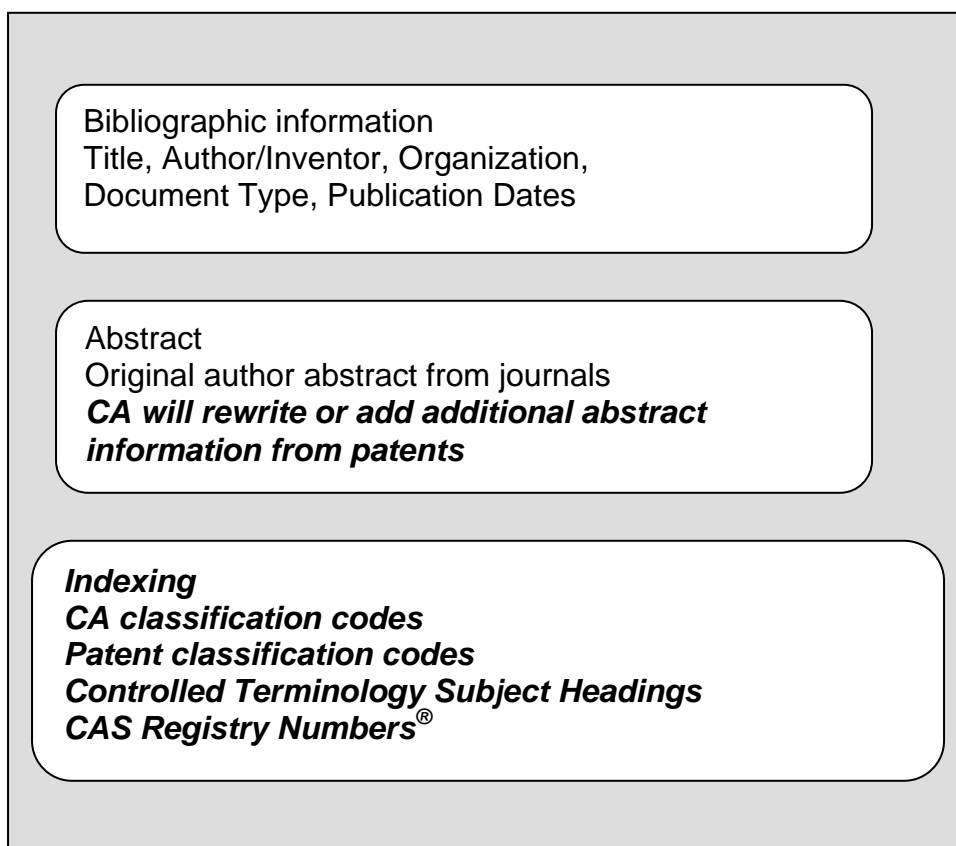
OVERVIEW

In this section, you will learn how to

- Distinguish among CAplus records based on the indexing present
- Describe the controlled vocabulary which can be retrieved via the CA Lexicon

Searching CAplus

The CAplus database is world-renowned for its content and value to searchers of scientific information. A CAplus record contains original data from a publication, plus additional information added by CAS indexers. CAS scientists add value by adding detailed information through their indexing of documents. The benefit to the searcher is to be able to find the “best” documents.



The controlled vocabulary indexing is a key feature of the database. It ensures precise results. Awareness of the following CAplus features will ensure that best advantage is taken of the controlled vocabulary

- Database content from 1907–present
- CA Lexicon

Database Content from 1907–Present

CAplus now includes the entire collection of *Chemical Abstracts*[™] (CA) from 1907–present. Approximately 3.8 million records from CA issues between 1907 and 1967 have been added to the online database, bringing the total number of online records in CAplus to more than 31 million. Pre-1967 content includes

- 789,000 patents
- 2.8 million journal records
- Books, technical reports, conference proceedings, and dissertations

In addition, pre-1907 data continues to be added to CAplus from other sources.

Indexing the pre-1967 data

Bibliographic information, abstracts, and section assignment are available for pre-1967 records

- CAS has added indexing by re-keying the subject and substance indexing from the *Collective Indexes*
- Substances that could be name matched via computer had CAS RNs added to the backfile and others were matched through intellectual effort.

As a result of this project, CAplus records covering different time periods contain different levels of indexing. The records can be categorized as follows

This category is used ...	To describe CAplus records covering this time period:
Fully indexed	1957–present
CAS RNs may not be assigned to all substances	1907-1956
Work in progress	Current
Unindexed	1995–present

Fully indexed records

Fully indexed records contain

- Classification codes CC field
- Supplementary terms ST field
- Index terms IT field

AN 2002:336071 CAPLUS [Full-text](#)
DN 137:262758
TI Concise synthesis of N-protected carboxyalkyl ether amines
AU Adamczyk, Maciej; Fishpaugh, Jeffrey R.; Thiruvazhi, Mohan
CS Diagnostics Division, Abbott Laboratories, Department of
Chemistry, Abbott Park, IL, 60064-6016, USA
SO Organic Preparations and Procedures International (2002), 34(3),
326-331
CODEN: OPPIAK; ISSN: 0030-4948
PB Organic Preparations and Procedures, Inc.
DT Journal
LA English
CC 23-9 (Aliphatic Compounds)
OS CASREACT 137:262758
GI

The CC field corresponds to the CA Sections in printed CA. Section assignment reflects the main perspective of the paper.



AB A synthesis of N-protected carboxyalkyl ether amines I (R = Boc, Cbz; n =1-3), potential water sol. PEG linkers for biomols., was developed. N-Protected amino alcs. II were O-alkylated with alkyl bromoacetate and the ester hydrolyzed.

ST amino alc bromoacetate alkylation hydrolysis; carboxyalkyl ether amine prepn

IT Glycols, preparation

RL: RCT (Reactant); SPN (Synthetic preparation);

RACT (Reactant or reagent)

(ethers; prepn. of N-protected aminoethyleneglycolacetic acids via O-alkylation of N-protected aminoethylene glycols with bromoacetates followed by ester hydrolysis)

IT Ethers, preparation

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(glycol; prepn. of N-protected aminoethyleneglycolacetic acids via O-alkylation of N-protected aminoethylene glycols with bromoacetates followed by ester hydrolysis)

IT Linking agents

(prepn. of N-protected aminoethyleneglycolacetic acids for use as water sol. poly(ethylene glycol) linkers)

The ST and IT fields contain subject and substance indexing.

(continued on next page)

IT 105-36-2, Ethyl bromoacetate 5292-43-3, tert-Butyl bromoacetate
 6338-55-2 13139-17-8, N-(Benzyloxycarbonyloxy)succinimide
 26690-80-2 139115-91-6 139115-92-7 145881-74-9
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (prepn. of N-protected aminoethyleneglycolacetic acids via
 O-alkylation of N-protected aminoethylene glycols with
 bromoacetates followed by ester hydrolysis)

•
•
•

*Cited references are available
 for CAPLUS records from 1997–
 present.*

RE.CNT 20 THERE ARE 20 CITED REFERENCES AVAILABLE
 RE

- (1) Bailey, J; Poly(ethyleneoxide) 1999
- (2) Boumrah, D; Tetrahedron 1997, V53, P6977 CAPLUS
- (3) Chandrakumar, N; J Med Chem 1992, V35, P2928 CAPLUS
- (4) Dhawan, R; Bioconjugate Chem 2000, V11, P14 CAPLUS
- (5) Dreborg, S; Crit Rev Ther Drug Carrier Syst 1990
- (6) Fish, I; US 4322440 1980 CAPLUS
- (7) Fish, I; US 4372974 1981 CAPLUS
- (8) Fish, I; 1983 CAPLUS
- (9) Frisch, B; Bioconjugate Chem 1996, V7, P180 CAPLUS

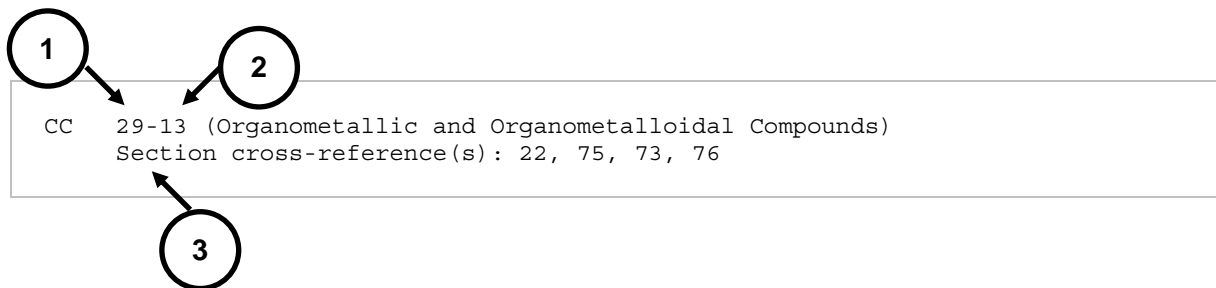
•
•
•

*The CAPLUS link at the end of a
 citation is a link to the CAPLUS
 record for the cited reference.*

Classification code indexing

The ***Classification Code (CC) field*** reflects the main perspective of the research paper. The classification code consists of 3 parts

1. Classification code, which is the main subject area of the paper (number and text searchable in the CC field)
2. Subsection code, which is a subject subdivision, started in 1972 (number searchable in the CC field)
3. Section cross-reference, which appears when a paper could legitimately be assigned to other subject areas, started in 1972 (number searchable in the SX field)



note

The CA section listing is available online

=> **HELP SECTIONS**

**Helpful
HINT**

Many factors affect CA section assignment. It is recommended that this field be used primarily for refining search results.

Subject indexing:

Subjects are indexed in the IT and ST index fields.

The **Index Term (IT) field** is available for CPlus records. Index term entries contain two parts

1. Controlled vocabulary
2. A text-modifying phrase, which is uncontrolled vocabulary, in parentheses

IT	Coating materials	1
2	(antisoiling; controlling dirt pick-up of exterior coatings)	

The **Supplementary Term (ST) field** is available for 1967–present. It is uncontrolled vocabulary.

ST	zeolite metal oxide clay ITQ7 prepn catalyst; acylation catalyst ITQ7 metal oxide arom compd; methoxynaphthalene acylation aluminum ITQ7 zeolite catalyst
----	---

note

Another type of subject index is available for patents. The **International Patent Classification (IPC) field** contains classifications and catchwords for main subject headings and subheadings from the *WIPO International Patent Classification Manual*.

The CPlus database has 4 different classification systems:

- IPC, including reclassified IPC from IPC Reform
- U.S. National Classifications
- ECLA
- F-terms

CLASS PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
US 5892104	ICM	C07C069-02
	ICS	C07C035-20; A61K007-46
	INCL	560231000
	IPCI	C07C0069-02 [ICM,6]; C07C0069-00 [ICM,6,C*]; C07C0035-20 [ICS,6]; C07C0035-00 [ICS,6,C*]; A61K0007-46 [ICS,6]
	IPCR	C07C0035-00 [I,C*]; C07C0035-20 [I,A]; C07C0069-00 [I,C*]; C07C0069-013 [I,A]
	NCL	560/231.000; 512/008.000; 549/518.000; 549/543.000; 549/544.000; 562/510.000; 568/671.000; 568/821.000
	ECLA	C07C035/20; C07C069/013

Work in progress records

Work in progress records are the newest entries in the database. Records contain classification codes (CC field). They *may* also have partial supplementary term (ST) and index term (IT) indexing, along with a note indicating "indexing in progress".

```
AN 2009:1084351 CAPLUS Full-text
ED Entered STN: 06 Sep 2009
TI Dielectric relaxation studies on [PEO-SiO2]:NH4SCN nanocomposite polymer
electrolyte films
AU Agrawal, S. L.; Singh, Markandey; Tripathi, Mridula; Dwivedi, Mrigank
Mauli; Pandey, Kamlesh
CS Department of Physics, A.P.S. University, MP, India
SO Journal of Materials Science No pp. yet given
CODEN: JMSTAS; ISSN: 0022-2461
PB Springer
DT Journal
LA English
CC 76 (Electric Phenomena)
AB Present work deals with findings on dielec. relaxation behavior and a.c.
conduction in a SiO2-doped polymer nanocomposite electrolyte system,
namely, [(100 - x)PEO + xSiO2]:yNH4SCN. The formation of nanocomposite
has been ascertained by XRD measurements. The effect of salt and filler
(SiO2) on conductivity response of PEO-based nanocomposite polymer
Electrolyte has been investigated by impedance spectroscopy. The variation
of dielec. permittivity, dielec. loss and modulus spectra with frequency and
temperature was carried out from impedance spectroscopy data. The a.c.
conductivity seems to follow the universal power law.
```

Pre-1957 records partially indexed with subject indexing

The process of adding indexing from the print *Collective Indexes* to the CAPLUS database involved computer matching of chemical names and subject concepts from the *General Subject Indexes* against existing CAS REGISTRYSM names and CAPLUS controlled terminology.

For records prior to 1957, CAS RNs may not be assigned to all substances. These substances appear indexed by name. Search strategies for pre-1957 information should allow for this.

```
AN 1955:84190 CAPLUS Full-text
DN 49:84190
OREF 49:15854d-i,15855a-h
TI Pyrrole dyes. I. Cyclotrimethine dyes of the pyrrole and indole series
AU Treibs, Alfred; Herrmann, Erwin
CS Tech. Hochschule Munich, Germany
SO Justus Liebig's Annalen der Chemie (1954), 589, 207-21
CODEN: JLACBF; ISSN: 0075-4617
DT Journal
LA Unavailable
OS CASREACT 49:84190
GI For diagram(s), see printed CA Issue.
```

OREF 49:15854d-i, 15855a-h refers to Volume 49, columns 15854 & 15855, column fractions d-i and a-h.

(continued on next page)

AB cf. preceding abstract 2,4-Dimethyl-3-carbethoxypyrrole (I) (1.7 g.) in alc. treated with 0.5 cc. cyclohexanone and 0.8 cc. concentrated HBr and warmed 5 min. gave 2 g. II (R = CO₂Et, X = Br) (IIa), blue-violet needles, m. 257° (from EtOH, after washing with Et₂O), giving reddish-violet solns. in Me₂CO, AcOH, and CHCl₃, absorption maximum 574 mμ. IIa was also formed from 3.5 g. I in alc. with 1.1 g. dihydroresorcinol and 2 cc. concentrated HBr. IIa could be converted readily to the following II (R = CO₂Et; X, absorption maximum in mμ (in brackets) and m.p. given): Cl, [577], 235°; NO₃, [576], 205°; SO₄H, [577], 207°; ClO₄, [275], 241°. Proximate detns. of these salts were made by titration with 0.1N or 0.01N NaOH to disappearance of the maximum absorption band. IIa (58.1 mg.) in 50 cc. EtOH was nearly decolorized with 1.16 cc. 0.1N NaOH, giving quantitatively the carbinol base (III), C₂₄H₃₂O₄N₂, prisms, m. 224°. The corresponding leuco base (IV), rhombohedrons, m. 218°, (70%), probably C₂₄H₃₂O₄N₂, was prepared by suspending 0.15 g. IIa in 1 cc. EtOH, adding an excess of powdered Zn, warming until colorless, precipitating with H₂O, and recrystg. from alc. When IV is

•

•

•

IT Spectra
(of cyclotrimethine dyes)

IT Dyes
(pyrrole)

*Substances not name matched
via computer appear indexed
by name.*

IT 2-Cyclohexen-1-one, 4-(3,5-dimethyl-2H-pyrrolen-2-ylidene)-2-(3,5-dimethyl-2-pyrrolyl)-, hydrobromide
2H-Pyrrolenine, 2-[3-(3,5-dimethyl-2-pyrrolyl)-2-cycloocten-1-ylidene]-3,5-dimethyl-, hydrobromide
3-Pyrrolicarboxylic acid, 5-(1-cycloocten-1-yl)-2,4-dimethyl-, ethyl ester
3H-Pseudoindole, 2-methyl-3-[3-(2-methyl-3-indolyl)-2-cyclohexen-1-ylidene]-, leuco base
Cyclotrimethines
RL: PREP (Preparation)

IT 2H-Pyrrolenine, 2-[3-(3,5-dimethyl-3-pyrrolyl)-2-cyclohexen-1-ylidene]-3,5-dimethyl-
(salts)

IT 62-49-7, Choline 120-72-9, Indole 857394-95-7, 3H-Pseudoindole, 2-methyl-3-[3-(2-methyl-3-indolyl)-2-cyclopenten-1-ylidene]-857421-52-4, 2H-Pyrrolenine-4-carboxylic acid, 2-[3-(4-carboxy-3,5-dimethyl-2-pyrrolyl)-2-cyclohexen-1-ylidene]-3,5-dimethyl-
(derivs.)

IT 109-97-7, Pyrrole
(dyes)

IT 68638-45-9P, Indole, 3,3'-(1,3-cyclohexadien-1,4-ylene)bis[2-methyl-130460-54-7P, 1-Pyrrolicarboxylic acid, 2,3,4,5-tetramethyl-, ethyl ester 159723-54-3P, 3H-Pseudoindole, 3-[3-(3-indolyl)-2-cyclohexen-1-ylidene]-, hydrobromide 412013-78-6P, Skatole, 2-(1-cyclohexen-1-yl)-854715-67-6P, Indole, 3,3'-(2-oxocyclohexylidene)bis[2-methyl-854715-67-6P, Cyclohexanone, 2,2-bis(2-methyl-3-indolyl)-857223-52-0P, 3H-Pseudoindole, 2-methyl-3-[3-(2-methyl-3-indolyl)-2-cyclohexen-1-ylidene]-, hydrobromide 857395-02-9P, 3H-Pseudoindole, 3-[3-(3-indolyl)-2-cyclopenten-1-ylidene]-, hydrobromide 857421-24-0P, 3H-Pyrrolenine, 3-[3-(2,5-dimethyl-3-pyrrolyl)-2-cyclopenten-1-ylidene]-2,5-dimethyl-,

•

•

•

Nonindexed records

Nonindexed records are unique to the CAPLUS database (by comparison to the CASM database). Nonindexed records are primarily from two sources

- Meeting abstracts from twice-yearly ACS national meetings
- Items from the CAPLUS core journals (cover-to-cover coverage of all items from the table of contents) that fall outside CAS coverage

Selected patents are also included. An example of such patents are those covering traditional medicine (health practices, approaches, knowledge, and beliefs incorporating plant-, animal-, and mineral-based medicines, spiritual therapies, manual techniques, and exercises applied singularly or in combination to treat, diagnose, and prevent illness or maintain well-being.)

Nonindexed records contain no CC field.

```
AN 2003:181073 CAPLUS Full-text
TI Creating the MARPAT file: Practical and philosophical issues in
   patent analysis and database building
AU Connolly, David E.
CS Dept. 56 - Synthetic and Polymer Chemistry, Chemical Abstracts
   Service, Columbus, OH, 43210, USA
SO Abstracts of Papers, 225th ACS National Meeting, New Orleans, LA,
   United States, March 23-27, 2003 (2003), CINF-047 Publisher:
   American Chemical Society, Washington, D. C.
   CODEN: 69DSA4
DT Conference; Meeting Abstract
LA English
AB Creating the MARPAT File: Practical and philosophical issues in
   patent anal. and database-building abstract: Most users of patent
   information see only the output of searches from the CAS MARPAT
   file. This presentation will explore what goes into creating the
   CAS MARPAT file and the challenges that database builders face in
   taking complex Markush structures from the literature and turning
   them into useful and meaningful information for our customers.
   These include: selection of Markush structures from patents,
   interpreting confusing or contradictory patent language and
   translating it into MARPAT coding that complements the CAS Registry
   File. The presentation will include data and observations on trends
   in the Markush literature.
```

Helpful HINT

Nonindexed records may be efficiently searched using

```
=> S NOSECTION/FS
```

Skills Practice

Directions: Use the excerpted CAPLUS record below to answer the following questions.

```
AN 1988:222965 CAPLUS
DN 108:222965
TI Rubber composition for tire treads
IN Halasa, Adel Farhan; Gross, Bill Bud; Cox, Joel Lynn;
   Balogh, George Frank
PA Goodyear Tire and Rubber Co., USA
SO Eur. Pat. Appl., 10 pp. CODEN: EPXXDW
DT Patent
LA English
IC ICM C08L009-00
   ICS B60C001-00
CC 39-13 (Synthetic Elastomers and Natural Rubber)
ST tire tread rubber glass temp; isoprene butadiene rubber
   tread; wear resistance tire tread;
   tetramethylethylenediamine modifier polymn; anionic polymn
   butadiene isoprene
IT Polymerization
   (anionic, two-stage, of dienes, for rubbers with
   multiple glass temp.)
IT Tires
   (treads, abrasion- and wet skid-resistant, rubbers for,
   with multiple glass temps.,)
```

1. Identify the patent classification codes.
2. What is the section assignment? _____
Is there a section cross-reference? _____
3. Identify the controlled-vocabulary indexing terms.

The CA Lexicon

The CA Lexicon is an online search tool for finding the CA index terms for

- General subjects
- Taxonomic terms
- Chemical classes

It is implemented using STN thesaurus features. The CA Lexicon, developed by CAS scientific experts, adds many additional relationships and features.

note

→ The CA Lexicon covers indexing from 1907–present.

Applications of the CA Lexicon

The CA Lexicon is useful for

- Identifying new and useful subject and chemical keywords
- Searching for references on broad subject areas
- Gathering information on classes of substances and organisms

General subject index terms

There are >40,000 nontaxonomic subject index terms covering all the areas of chemistry and chemical engineering in CA.

Chemistry is a fast-moving, evolving science. Over the years, controlled vocabulary index terms covered by the CA Lexicon have been changed or deleted and new index terms have been added. The CA Lexicon gives insight into current and past indexing practices.

Illustration

E1	56964	BT1 Analysis/CT
E2	56964	BT3 Analysis/CT
E3	26656	BT3 Separation/CT
E4	119928	BT2 Chromatography/CT
E5	296	BT1 Electrochromatography/CT
E6	26656	BT1 Separation/CT
E7	11211	--> Electrophoresis/CT
		HNTE Valid heading during volume 1 (1907) to present.
E8	1	OLD Anaphoresis/CT
E9	67	OLD Cataphoresis/CT
E10		OLD Electrophoresis (L) anaphoresis/CT
E11	2676	OLD Electrophoresis (cataphoresis)/CT
E12	18779	OLD Electrophoresis and Ionophoresis/CT
E13	657	OLD Electrophoresis, Electrochromatography/CT
E14	804	OLD Electrophoresis, Electrochromatography and(or) Ionophoresis/CT
E15	74	OLD Ionophoresis/CT
E16		UF Cataelectrophoresis/CT
E17		UF Cataionophoresis/CT
E18		UF Electrophoretic anal./CT
E19		UF Electrophoretic mobility/CT
E20		UF Electrophoretic sepn./CT
E21		UF Ionoelectrophoresis/CT
E22	14171	NT1 Capillary electrophoresis/CT
E23	307	NT2 Capillary isotachophoresis/CT
E24	3375	NT2 Capillary zone electrophoresis/CT
E25	672	NT2 High-performance capillary electrophoresis/CT
E26	1542	NT1 Dielectrophoresis/CT
E27	14327	NT1 Gel electrophoresis/CT
E28	434	NT2 Comet assay/CT
E29	653	NT1 Immunolectrophoresis/CT
E30	2038	NT1 Iontophoresis/CT
E31	3626	NT1 Isoelectric focusing/CT
E32	404	NT2 Capillary isoelectric focusing/CT
E33	312	NT1 Isotachophoresis/CT
E34	307	NT2 Capillary isotachophoresis/CT
E35	35651	RT Colloids/CT
E36	7103	RT Disperse systems/CT
E37	7122	RT Electrodiffusion/CT
E38	253	RT Electrokinetic chromatography/CT
E39	1656	RT Electrokinetic phenomena/CT
E40	2296	RT Electrophoresis apparatus/CT
E41	1925	RT Electrophoretic deposition/CT
E42	4704	RT Isoelectric point/CT
E43	48693	RT Mass transfer/CT
E44	462	RT Streaming potential/CT
E45	11538	RT Zeta potential/CT
***** END *****		

*Current and past indexing practices are defined in the following entries:
HNTE = history note
OLD = old controlled term*

Taxonomic indexing terms

Taxonomic terms are used to index animals, plants, and microorganisms. The CA Lexicon is a rich source of >140,000 taxonomic indexing terms.

Illustration:

E1	80057	BT2 Food/CT
E2	0	BT1 Plant-derived food (non-CA heading)/CT
E3	629	BT7 Organisms/CT
E4	6647	BT6 Eukaryota/CT
E5	8177	BT5 Plantae/CT
E6	744	BT4 Magnoliophyta/CT
E7	1369	BT3 Liliopsida/CT
E8	3	BT2 Cyperales/CT
E9	4342	BT1 Poaceae/CT
E10	9146	--> Cereal (grain)/CT
		HNTE Valid heading during volume 126 (1997) to present.
E11	6253	OLD Cereal/CT
E12	1828	OLD Cereals/CT
E13	486	OLD Cereals (plants and seeds)/CT
E14	1076	OLD Cereals and Grains/CT
E15	165	OLD Grain/CT
E16	1530	OLD Grains/CT
E17		UF Cereal grains/CT
E18		UF Gramineous crops/CT
E19	4229	NT1 Avena sativa/CT
E20	1	NT2 Avena sativa diffusa/CT
E21	3	NT2 Avena sativa nuda/CT
E22	33122	NT1 Barley/CT
E23	9164	NT1 Bran/CT
E24	3259	NT2 Wheat bran/CT
E25	381	NT1 Chenopodium quinoa/CT
E26	1	NT2 Chenopodium quinoa quinoa/CT
E27	61223	NT1 Corn/CT
E28	253	NT1 Eleusine coracana/CT
E29	3	NT2 Eleusine coracana africana/CT
E30	1670	NT1 Fagopyrum esculentum/CT
E31	14	NT2 Fagopyrum esculentum ancestrale/CT
E32	4	NT2 Fagopyrum esculentum esculentum/CT
E33	2	NT2 Fagopyrum esculentum homotropicum/CT
E34	10616	NT1 Hordeum vulgare/CT
E35	7	NT2 Hordeum vulgare agriocrithon/CT
E36	7	NT2 Hordeum vulgare akashinriki/CT
E37	0	NT2 Hordeum vulgare alfa/CT
E38	1	NT2 Hordeum vulgare brunneinudrum/CT
E39	1	NT2 Hordeum vulgare deficiens/CT
E40	0	NT2 Hordeum vulgare disticum/CT

*Searches for broad subject terms can be enhanced using:
 BT = broader terms
 NT = narrower terms
 RT = related terms*

(continued on next page)

E41	7	NT2	Hordeum vulgare harunanijo/CT
E42	3	NT2	Hordeum vulgare hexastichum/CT
E43	9	NT2	Hordeum vulgare nudum/CT
E44	1	NT2	Hordeum vulgare nutans/CT
E45	1	NT2	Hordeum vulgare pallidum/CT
E46	0	NT2	Hordeum vulgare polystichum/CT
E47	1	NT2	Hordeum vulgare rikotense/CT
E48	92	NT2	Hordeum vulgare spontaneum/CT
E49	1	NT2	Hordeum vulgare stendelii/CT
E50	0	NT2	Hordeum vulgare tetrastichum/CT
E51	241	NT2	Hordeum vulgare vulgare/CT
E52	1536	NT1	Panicum/CT
E53	3	NT2	Panicum amarulum/CT
E54	9	NT2	Panicum amarum/CT
E55	5	NT3	Panicum amarum amarulum/CT
●			
●			
●			
E216	5	NT2	Triticum aestivum yunnanense/CT
E217	970	NT2	Triticum turgidum durum/CT
E218	60308	NT1	Wheat/CT
E219	26220	NT1	Zea mays/CT
E220	3	NT2	Zea mays amylacea/CT
E221	3	NT2	Zea mays ceratina/CT
E222	2	NT2	Zea mays everata/CT
E223	2	NT2	Zea mays everta/CT
E224	1	NT2	Zea mays flavorubra/CT
E225	13	NT2	Zea mays huehuetenangensis/CT
E226	27	NT2	Zea mays indentata/CT
E227	5	NT2	Zea mays indurata/CT
E228	1	NT2	Zea mays luxurians/CT
E229	69	NT2	Zea mays mays/CT
E230	52	NT2	Zea mays mexicana/CT
E231	56	NT2	Zea mays parviglumis/CT
E232	1	NT2	Zea mays rubrovelata/CT
E233	333	NT2	Zea mays saccharata/CT
E234	2	NT2	Zea mays tunicata/CT
E235	29098	RT	Feed/CT
E236	1972	RT	Prolamins/CT
E237	34895	RT	Seed/CT
*****	END	*****	

Substance class index terms

Terms like terpenes, epoxides, minerals, lactams, and vitamins are examples of substance class indexing terms. The CA Lexicon links >9,000 frequently indexed specific substances to subject index terms.

Illustration

E1	3902	BT1	Toxicants/CT
E2	77993	-->	Toxins/CT
			HNTE Valid heading during volume 1 (1907) to present.
			NOTE Trivially named toxins are indexed at their own
			headings in the Chemical Substance index.
E3	32	OLD	Arrow poisons/CT
E4	2	OLD	Toxin/CT
E5		UF	Toxemia toxins/CT
E6		UF	Toxic materials/CT
E7		UF	Toxic substances/CT
E8	0	NT1	Apamin/CT
E9	2243	NT1	Lymphotoxin/CT
E10	0	NT1	Microcystin/CT
E11	0	NT2	Microcystin LR/CT
E12	6848	NT1	Mycotoxins/CT
E13	5808	NT2	Aflatoxins/CT
E14	0	NT3	Aflatoxin B1/CT
E15	0	NT3	Aflatoxin B2/CT
E16	0	NT3	Aflatoxin M1/CT
E17	0	NT3	Aflatoxin g1/CT
E18	0	NT3	Aflatoxin g2/CT
E19	0	NT2	Deoxynivalenol/CT
E20	752	NT2	Fumonisin/CT
E21	0	NT2	Nivalenol/CT
E22	0	NT2	Trichothec-9-ene/CT
E23	326	NT1	Phytotoxins/CT
E24	0	NT1	Picrotoxin/CT
E25	0	NT1	Proteinaceous toxins (non-CA heading)/CT
E26	663	NT2	Abrins/CT
E27	0	NT2	Botulin/CT
E28	0	NT3	Botulin A/CT
E29	0	NT3	Botulin E/CT
E30	2174	NT2	Enterotoxins/CT
E31	295	NT3	Enterotoxin A/CT
E32	488	NT3	Enterotoxin B/CT
E33	143	NT3	Enterotoxin C/CT
E34	68	NT3	Enterotoxin D/CT
E35	40	NT3	Enterotoxin E/CT
E36	1186	NT2	Exotoxins/CT
E37	165	NT2	Hemorrhagins/CT
E38	3335	NT2	Ricins/CT
E39	367	NT2	Trichosanthin/CT
E40	0	NT1	Saxitoxin/CT
E41	0	NT1	Tetrodotoxin/CT
E42	1332	RT	Allelochemicals/CT
E43	1327	RT	Antidotes/CT
E44	163937	RT	Antigens/CT

Searches for classes of chemical substances can be enhanced using the specific substances in:
NT = narrower terms
RTCS = related term chemical substance

(continued on next page)

```
E45      1943      RT   Antitoxins/CT
E46      1434      RT   Biological warfare agents/CT
E47      5198      RT   Chemical warfare agents/CT
E48      1150      RT   Food poisoning/CT
E49      31981     RT   Health hazard/CT
E50      3997      RT   Toxoids/CT
E51      15698     RT   Venoms/CT
E52                      RTCS Coagulase/CT
E53                      RTCS Microcystin LR/CT
*****  END  *****
```

note

→ Specific substances available in the CA Lexicon are substances that are frequently referenced. They are either

- Compounds with >500 references
- Frequently cited new compounds

 **Web
Resource**

More details on the CA Lexicon may be found in STNote #25 at www.cas.org/support/stngen/stnotes/

THESAURUS TOOLS

In this section, you will learn to

- Determine thesaurus availability in a database
- Use relationship codes to create controlled-term search strategies
- Create Basic Index search strategies using terminology derived from online thesauri

Online Thesauri

Many STN databases contain online thesauri. They are useful for identifying database-specific controlled vocabulary. These vocabulary terms can be used to develop

- Database-specific search strategies of controlled term fields
- Basic Index search strategies for keyword-searchable databases, such as CAplus

CAplus Thesauri

CAplus contains thesauri associated with several indexes

Index	Code	Description
Controlled Term	CT	CA Lexicon, covering indexing from 1907--present
Classification Code	CC	Section code assignments from 1907--present
Company Names	CO	Most frequently occurring major company names for records from 1907 to the present
International Patent Classification Code	IPC	Code definitions
U.S. National Classifications	NCL	Class definitions for the U.S. patent classification system
F-Term	FTERM	Patent classifications from the Japanese Patent Office
CAS Role	RL	CAS role definitions

Note: not all of these thesauri will be illustrated in this workshop.

note

To learn more about a database's thesaurus features, use the following

=> **HELP THESAURUS**

Develop a Controlled-Term Strategy

Using an online thesaurus to develop a controlled-term search strategy involves three steps

1. Verify that a term is in the thesaurus
2. View the hierarchy of associated controlled terminology
3. Search on the controlled terminology

Helpful HINT

Thesaurus searching can involve many hundreds of search terms. It is recommended that the HCAplus database be used.

Verify the Term

The EXPAND command is used to determine whether a term is in the thesaurus. The presence of an AT (Associated Terms) column indicates that thesaurus terminology is available.

```
=> FILE HCAPLUS
```

```
=> E RING CLOSURE/CT
```

E#	FREQUENCY	AT	TERM
E1	0	2	RING CLOSING/CT
E2	0	3	RING CLOSING METATHESIS/CT
E3	2833	2 -->	RING CLOSURE/CT
E4	0	2	RING CLOSURE (L) PHOTOCHEM./CT
E5	0	2	RING CLOSURE (L) POMERANZ-FRITSCH/CT
E6	35987	2	RING CLOSURE AND FORMATION/CT
E7	0	2	RING CLOSURE AND FORMATION (L) ALDER-ENE/CT
E8	0	2	RING CLOSURE AND FORMATION (L) BARTON/CT
E9	0	2	RING CLOSURE AND FORMATION (L) BENZANNULATION/CT
E10	0	2	RING CLOSURE AND FORMATION (L) BISCHLER-NAPIERALSKI/CT
E11	0	2	RING CLOSURE AND FORMATION (L) CYCLOPENTANNULATION/CT
E12	0	2	RING CLOSURE AND FORMATION (L) CYCLOPROPANATION/CT

One other associated term is available.

View the Hierarchy

The EXPAND command is used to view associated terms. The ALL relationship code is used to see the full hierarchy.

```
=> E E3+ALL
```

```
E1      2833  --> Ring closure/CT
          HNTE Valid heading during volumes 11-75 (1917-1971) only.
E2      31359 NEW Cyclization/CT
***** END *****
```

Note the search line syntax. The ALL relationship code shows a change in indexing policy in 1972.

The full thesaurus hierarchy can be viewed

```
=> E E2+ALL
```

```
E1      30632  BT1 Reaction/CT
E2      31359  --> Cyclization/CT
          HNTE Valid heading during volume 126 (1997) to present.
E3      2833   OLD Ring closure/CT
E4      35987  OLD Ring closure and formation/CT
E5      6359   OLD Ring closure or formation/CT
E6      UF    Annelation/CT
E7      UF    Annulation/CT
E8      UF    Baldwin's rules/CT
E9      UF    Carbocyclic annulation/CT
E10     UF    Carbocyclic ring formation/CT
E11     UF    Chelatropic reaction/CT
E12     UF    Cyclialkylation/CT
E13     UF    Cyclization reaction/CT
E14     UF    Cycloaromatization/CT
E15     UF    Cyclodehydrogenation/CT
E16     UF    Dehydrocyclization/CT
E17     UF    Hydroforming/CT
E18     UF    Intramolecular annulation/CT
E19     UF    Intramolecular cyclization/CT
E20     UF    Intramolecular ring closure/CT
E21     UF    Intramolecular ring closure and formation/CT
E22     UF    Ring closing/CT
E23     UF    Ring formation/CT
E24     UF    Template effect/CT
E25     35     NT1 Bergman cyclization/CT
E26     36     NT1 Bischler-Napieralski cyclization/CT
E27     34725  NT1 Cycloaddition reaction/CT
E28     17332  NT2 Diels-Alder reaction/CT
E29     477    NT1 Cycloalkylation/CT
E30     31864  NT1 Cyclocondensation reaction/CT
E31     141    NT2 Biginelli reaction/CT
E32     42     NT2 Darzens cyclocondensation reaction/CT
E33     461    NT2 Dieckmann condensation/CT
E34     130    NT2 Hantzsch cyclocondensation reaction/CT
E35     23     NT2 Knorr reaction/CT
E36     56     NT2 Pechmann condensation/CT
E37     149    NT2 Pictet-Spengler cyclocondensation reaction/CT
E38     497    NT1 Cyclodimerization/CT
```

(continued on next page)

E39	2093	NT1	Cyclopropanation/CT
E40	262	NT2	Simmons-Smith reaction/CT
E41	26	NT1	Cyclotetramerization/CT
E42	640	NT1	Cyclotrimerization/CT
E43	3	NT1	Doebner-Miller cyclization/CT
E44	609	NT1	Fischer indole synthesis/CT
E45	0	NT1	Grewe cyclization/CT
E46	169	NT1	Heck cyclization/CT
E47	7681	NT1	Heterocyclization/CT
E48	141	NT2	Biginelli reaction/CT
E49	1	NT1	Hofmann-Loeffler-Freytag cyclization/CT
E50	1	NT1	Kostanecki-Robinson cyclization/CT
E51	2643	NT1	Lactonization/CT
E52	1739	NT1	Macrocyclization/CT
E53	10	NT1	Nenitzescu indole synthesis/CT
E54	19	NT1	Paterno-Buechi cyclization/CT
E55	5	NT1	Pomeranz-Fritsch cyclization/CT
E56	5	NT1	Pschorr cyclization/CT
E57	28	NT1	Robinson annulation/CT
E58	995	NT1	Spirocyclization/CT
E59	4857	RT	Aromatization/CT
E60	6593	RT	Cyclic compounds/CT
E61	4548	RT	Cyclization catalysts/CT
E62	241	RT	Cyclization enthalpy/CT
E63	790	RT	Cyclization kinetics/CT
E64	950	RT	Ring (molecular)/CT
E65		RTCS	6-Bromo-1-hexene/CT

***** END *****

Search the Controlled Terminology

The SEARCH command can be used to develop a strategy of relevant terminology.

```
=> S E2+UF,OLD,NT
L1      170080 CYCLIZATION+UF,OLD,NT/CT (56 TERMS)
```

note

Use the following help message to determine the relationship codes available in a particular thesaurus

```
=> HELP RCODES
```

CA Lexicon relationship codes

The following relationship codes may be used with the EXPAND and SEARCH commands in the Controlled Term (/CT) field

Relationship code	Description
ALL	All Associated Terms, except no LT terms (BT, SELF, HN, NOTE, UF, USE, OLD, NEW, NT, RT, RTCS)
MAX	All Associated Terms, including LT terms (BT, SELF, LT, HN, NOTE, UF, USE, OLD, NEW, NT, RT, RTCS)
BT	Broader Terms (BT, SELF)
HIE	Hierarchy (BT, SELF, NT)
HN (displays as HNTE)	History note (detail on when controlled terms were valid)
KT	Keyword terms (SELF, KT)
LT	Linking terms (index heading modifying term)
NEW	New terms (replace OLD terms)
NOTE	Notes associated with the term (SELF, NOTE)
NT	Narrower terms (SELF, NT)
OLD	Old term (replaced by NEW term)
PFT	All preferred and forbidden terms (SELF, OLD, NEW, USE, UF)
RT	Related terms (SELF, RT)
RTCS	Related chemical substance terms (SELF, RTCS)
STD	Standard terms (SELF, BT, HNTE, NT, RT, RTCS)
UF	Used for (forbidden terms) (SELF, UF)
USE	Use terms (SELF, USE)

Helpful HINT

An Automatic Relationship Code (ARC) of PFT has been assigned for the /CT thesaurus. The default SET value is OFF. If you would like the system to automatically append this relationship any time that you use the SEARCH or EXPAND commands with the /CT field code, enter SET REL ON at an arrow prompt (=>). If you would like the system to append the ARC values for a single SEARCH or EXPAND command in the /CT field, include REL=ON in your command line, e.g.,
S CHROMATOGRAPHY/CT REL=ON.

Develop a Basic Index Strategy

The CA Lexicon is a rich resource for search terminology. Basic Index strategies can be developed quickly and searched in any bibliographic database.

=> FILE HCAPLUS

=> E REFRIGERANTS/CT

E#	FREQUENCY	AT	TERM
E1	0	1	REFREX/CT
E2	0	1	REFRIGERANT/CT
E3	7973	21 -->	REFRIGERANTS/CT
E4	0	1	REFRIGERATING/CT
E5	0	2	REFRIGERATING AGENTS/CT
E6	11117	16	REFRIGERATING APPARATUS/CT
E7	0	6	REFRIGERATING APPARATUS (L) ABSORPTION/CT
E8	0	7	REFRIGERATING APPARATUS (L) ABSORPTION, SOLAR/CT
E9	0	6	REFRIGERATING APPARATUS (L) ADSORPTION/CT
E10	0	3	REFRIGERATING APPARATUS (L) ADSORPTION, SOLAR/CT
E11	0	6	REFRIGERATING APPARATUS (L) COMPRESSORS/CT
E12	0	3	REFRIGERATING APPARATUS (L) HOUSEHOLD/CT

=> E E3+ALL

E1	23646	BT2	Materials/CT
E2	4368	BT1	Coolants/CT
E3	7973	-->	Refrigerants/CT
			HNTE Valid heading during volume 126 (1997) to present.
E4		OLD	Refrigeration (L) agents/CT
E5		UF	Refrigerating agents/CT
E6		UF	Refrigeration agents/CT
E7		UF	Refrigeration oil/CT
E8	12601	RT	Air conditioning/CT
E9	11117	RT	Refrigerating apparatus/CT
E10	11363	RT	Refrigeration/CT
E11		RTCS	1,1,1,2-Tetrafluoroethane/CT
E12		RTCS	1,1,1,3,3-Pentafluoropropane/CT
E13		RTCS	1,1,1-Trifluoroethane/CT
E14		RTCS	1,1,2,2-Tetrafluoroethane/CT
E15		RTCS	1,1-Difluoroethane/CT
E16		RTCS	1-Chloro-1,1-difluoroethane/CT
E17		RTCS	2,2-Dichloro-1,1,1-trifluoroethane/CT
E18		RTCS	2-Chloro-1,1,1,2-tetrafluoroethane/CT
E19		RTCS	Chlorodifluoromethane/CT
E20		RTCS	Difluoromethane/CT
E21		RTCS	Pentafluoroethane/CT

This entry points to an index term used before 1997, as well as some synonyms.

A more comprehensive search strategy results from use of the CA Lexicon.

***** END *****

=> S REFRIGERANT? OR REFRIGERAT? (3A) (AGENT? OR OIL?)

L1 27525 REFRIGERANT? OR REFRIGERAT? (3A) (AGENT? OR OIL?)

ENHANCE SUBJECT SEARCH RESULTS

In this section, you will learn to

- Develop precise search strategies using controlled terminology
- Develop comprehensive Basic Index search strategies using terminology determined using the CA Lexicon
- Analyze search results to determine relevant controlled terminology

Improve Basic Index Search Results

Basic Index search results can often be improved by incorporating database-specific controlled terminology into the search strategy. Relevant controlled terminology can be determined by a number of techniques

- Review index terms for valid hits from the Basic Index search
- Access the CA Lexicon for key terms
- Analyze controlled terminology from an answer set

Review Index Terms in Answer Sets

One way to identify additional terminology for use in search strategy development is to manually review the results of a preliminary Basic Index search and identify relevant terms. Depending on the answer set size, this can be a time-consuming task.

Search Question: *Locate information on the control of sagebrush.*

Preliminary Basic Index search

```
=> FILE HCAPLUS
=> S SAGEBRUSH AND (WEED (L) (CONTROL OR HERBICID?))
L1          50 SAGEBRUSH AND (WEED (L) (CONTROL OR HERBICID?))
=> D SCAN IT
L1  50 ANSWERS  HCAPLUS  COPYRIGHT 2009 ACS on
IT  Artemisia and(or) Sagebrush
    (control by 2,4-D Bu ester)
IT  Artemisia and(or) Sagebrush
    (control of A. tridentata, by 2,4-D)
IT  Weed control
    (for sagebrush by 2,4-D Bu ester)
IT  Acetic acid, (2,4-dichlorophenoxy) - (2,4-D)
    Acetic acid, (2,4-dichlorophenoxy) - (2,4-D), butyl esters
    (in sagebrush control)

HOW MANY MORE ANSWERS DO YOU WISH TO SCAN? (1):1
L1  50 ANSWERS  HCAPLUS  COPYRIGHT 2009 ACS on STN
IT  Herbicides
    (Wasatch milkvetch and associated species control by, in mountain
    rangeland)
IT  Artemisia tridentata
    Astragalus miser oblongifolius
    Wyethia amplexicaulis
    (control of, in mountain rangeland)
IT  Weed control
    (of Wasatch milkvetch, in mountain rangeland)
IT  1702-17-6  8068-77-7  37339-60-9  55335-06-3, Triclopyr  64664-
    51-3  79636-51-4  83645-26-5
    RL: BIOL (Biological study)
    (Wasatch milkvetch and associated species control by, in mountain
    rangeland)

HOW MANY MORE ANSWERS DO YOU WISH TO SCAN? (1):0
```

D SCAN IT shows only the IT portion of the D SCAN display, allowing you to focus on the indexing.

note

The following SET commands were implemented

- SET PLURALS ON
- SET ABBREV ON

Additional terms identified

<i>Worksheet</i>	
Sagebrush	Weed control
Artemesia	Herbicide

Access the CA Lexicon for Key Terminology

The CA Lexicon is a rich resource for identifying relevant CPlus controlled terminology quickly. These terms can be used in both

- Precise search strategies of controlled indexing
- Comprehensive Basic Index search strategies

Search Strategy

To develop CPlus search strategies using controlled terminology

- Step 1 Verify the term is in the database
- Step 2 View the hierarchy of associated controlled terminology
- Step 3 Search on the controlled terminology
- Step 4 Display results

Step 1: Verify the term is in the database

```
=> FILE HCAPLUS
```

```
=> SET EXPAND CONTINUOUS
```

```
SET COMMAND COMPLETED
```

```
=> E WEED CONTROL/CT 5
```

E#	FREQUENCY	AT	TERM
--	-----	--	----
E1	0	7	WEED (L) AQUATIC/CT
E2	0	6	WEED (L) PERENNIAL/CT
E3	21925	9 -->	WEED CONTROL/CT
E4	0	2	WEED CONTROL (HERBICIDAL)/CT
E5	0	2	WEED CONTROL AGENTS/CT

Weed control has 9 associated terms.

Helpful HINT

SET EXPAND CONTINUOUS is useful when navigating through thesaurus entries. It ensures that E-numbers continue sequentially and are not overwritten.

Step 2: View the hierarchy of associated controlled terminology

```
=> E E3+ALL
```

```
E6      7836  BT1  Agriculture and Agriculture
E7      21925  -->  Weed control/CT
        HNTE Valid heading during volume 21 (1927) to present.
E8              UF  Weed control (herbicidal)/CT
E9              UF  Weedicides/CT
E10     546    RT  Growth inhibitors, plant/CT
E11    52759  RT  Herbicides/CT
E12     8383  RT  Hormones, plant/CT
E13     1984  RT  Mulches/CT
E14     1415  RT  Weed/CT
***** END *****
```

The History Note (HNTE) indicates that weed control has been a valid heading since 1927.

```
=> E E11+ALL
```

```
E15     23646  BT6  Materials/CT
E16     14720  BT5  Chemicals/CT
E17     4232   BT4  Agrochemicals/CT
E18      0     BT3  Plant agrochemicals (non-CA heading)/CT
E19     3778   BT2  Growth regulators, plant/CT
E20     546    BT1  Growth inhibitors, plant/CT
E21     23646  BT3  Materials/CT
E22     4340   BT2  Biocides/CT
E23     52441  BT1  Pesticides/CT
```

(continued on next page)

E24	23646	BT4	Materials/CT
E25	14720	BT3	Chemicals/CT
E26	4232	BT2	Agrochemicals/CT
E27	0	BT1	Plant agrochemicals (non-CA heading)/CT
E28	52759	-->	Herbicides/CT
		HNTE	Valid heading during volume 1 (1907) to present.
E29		OLD	Herbicides (L) selective, synergistic/CT
E30		OLD	Herbicides (L) synergistic/CT
E31		UF	Herbicide/CT
E32		UF	Phytocides/CT
E33		UF	Selective synergistic herbicides/CT
E34		UF	Synergistic herbicides/CT
E35		UF	Synergistic phytocides/CT
E36		UF	Synergistic selective herbicides/CT
E37		UF	Weed control agents/CT
E38		UF	Weedicides/CT
E39	0	NT1	2,3,6-Trichlorobenzoic acid/CT
E40	1004	NT1	Defoliants/CT
E41	83	NT1	Desiccants, plant/CT
E42	891	RT	Herbicide antidotes/CT
E43	6549	RT	Herbicide resistance/CT
E44	8383	RT	Hormones, plant/CT
E45	22190	RT	Mutagens/CT
E46	1415	RT	Weed/CT
E47	21925	RT	Weed control/CT
E48		RTCS	(2,4,5-Trichlorophenoxy)acetic acid/CT
E49		RTCS	(2-Methyl-4-chlorophenoxy)acetic acid/CT
E50		RTCS	1,3-Cyclohexanedione/CT
E51		RTCS	Acetochlor/CT
E52		RTCS	Acetolactate synthase/CT
E53		RTCS	Alachlor/CT
E54		RTCS	Ametryn/CT
E55		RTCS	Aminomethylene phosphonic acid/CT
E56		RTCS	Atrazine/CT
E57		RTCS	Bensulfuron methyl/CT
E58		RTCS	Bentazon/CT
E59		RTCS	Bifenox/CT
E60		RTCS	Bromoxynil/CT
E61		RTCS	Butachlor/CT
E62		RTCS	Butyl (2,4-dichlorophenoxy)acetate/CT
E63		RTCS	Chlorpropham/CT
E64		RTCS	Chlorsulfuron/CT
E65		RTCS	Chlortoluron/CT
E66		RTCS	Cyanazine/CT
E67		RTCS	Deethylatrazine/CT
E68		RTCS	Deisopropylatrazine/CT
E69		RTCS	Desmetryn/CT
E70		RTCS	Dicamba/CT
E71		RTCS	Dichlorprop/CT
E72		RTCS	Diuron/CT
E73		RTCS	Ethofumesate/CT
E74		RTCS	Fructosyltransferase/CT
E75		RTCS	Glufosinate/CT

(continued on next page)

E76	RTCS Glyphosate/CT
E77	RTCS Glyphosate isopropylamine/CT
E78	RTCS Hydroxyatrazine/CT
E79	RTCS Imazaquin/CT
E80	RTCS Imazethapyr/CT
E81	RTCS Isoproturon/CT
E82	RTCS Linuron/CT
E83	RTCS Metamitron/CT
E84	RTCS Metolachlor/CT
E85	RTCS Metribuzin/CT
E86	RTCS Metsulfuron-methyl/CT
E87	RTCS Molinate/CT
E88	RTCS N-1-Naphthylphthalamic acid/CT
E89	RTCS Norflurazon/CT
E90	RTCS Pendimethalin/CT
E91	RTCS Picloram/CT
E92	RTCS Prometon/CT
E93	RTCS Prometryn/CT
E94	RTCS Propanil/CT
E95	RTCS Propazine/CT
E96	RTCS Propyzamide/CT
E97	RTCS Sethoxydim/CT
E98	RTCS Simazine/CT
E99	RTCS Simetryn/CT
E100	RTCS Stearoyl-ACP desaturase/CT
E101	RTCS Sucrose 6-fructosyltransferase/CT
E102	RTCS Terbutylazine/CT
E103	RTCS Terbutryn/CT
E104	RTCS Thiobencarb/CT
E105	RTCS Triclopyr/CT
E106	RTCS Trifluralin/CT

***** END *****

Verify the terminology for sagebrush

=> E SAGEBRUSH+ALL/CT

E107 2 --> Sagebrush/CT
 E108 1412 USE Artemisia/CT
 ***** END *****

=> E E108+ALL

E109 629 BT7 Organisms/CT
 E110 6647 BT6 Eukaryota/CT
 E111 8177 BT5 Plantae/CT
 E112 744 BT4 Magnoliophyta/CT
 E113 1204 BT3 Magnoliopsida/CT
 E114 14 BT2 Asterales/CT
 E115 554 BT1 Asteraceae/CT
 E116 1412 --> Artemisia/CT

*NOTE tells when a heading was used.
 OLD shows terms that have been replaced.*

HNTE Valid heading during volume 86 (1977) to present.

NOTE This heading is used for studies on the genus Artemisia and unidentified species. Identified species are indexed at the corresponding scientific names.

E117 2 OLD Abrotanum/CT
 E118 92 OLD Absinthium/CT
 E119 230 OLD Artemisia and(or) Sagebrush/CT
 E120 3 OLD Mugwort/CT
 E121 UF Absinth/CT
 E122 UF Armoise/CT
 E123 UF Oligosporus/CT
 E124 UF Sagebrush/CT
 E125 UF Wormwood/CT
 E126 53 NT1 Artemisia abrotanum/CT
 E127 294 NT1 Artemisia absinthium/CT
 E128 6 NT1 Artemisia abyssinica/CT
 E129 5 NT1 Artemisia adamsii/CT
 E130 33 NT1 Artemisia afra/CT
 E131 2 NT1 Artemisia aksaiensis/CT
 E132 5 NT1 Artemisia alba/CT
 E133 1 NT1 Artemisia albida/CT
 E134 1 NT1 Artemisia altaiensis/CT
 E135 7 NT1 Artemisia anethifolia/CT
 E136 3 NT1 Artemisia anethoides/CT

●
 ●
 ●

E447 411 NT1 Artemisia vulgaris/CT
 E448 3 NT2 Artemisia vulgaris vulgatissima/CT
 E449 1 NT1 Artemisia wallichiana/CT
 E450 1 NT1 Artemisia wudanica/CT
 E451 6 NT1 Artemisia xanthochroa/CT
 E452 4 NT1 Artemisia xerophytica/CT
 ***** END *****

Step 3: Search the controlled terminology

The controlled vocabulary portion of the index term has its own search field (/CT). Several search paths are available

- Combination strategy
- Controlled-term strategy
- CA Lexicon terms in the Basic Index strategy

Combination strategy

A combination strategy incorporates CA Lexicon terminology for one concept and free text for the other. This search results in very focused answers. Proximity is used to ensure that the sagebrush term appears in the text of the index entries.

```
=> S E7
```

```
L2      21925 "WEED CONTROL"/CT
```

```
=> S E28+NT,RTCS
```

```
L3      99603 HERBICIDES+NT,RTCS/CT (63 TERMS)
```

```
=> S (L2 OR L3) (L) SAGEBRUSH
```

```
L4      31 (L2 OR L3) (L) SAGEBRUSH
```

```
=> D SCAN HIT
```

```
L4      31 ANSWERS HCAPLUS COPYRIGHT 2009 ACS on STN
```

```
IT      Weed control  
        (of big sagebrush, with tebuthiuron)
```

```
HOW MANY MORE ANSWERS DO YOU WISH TO SCAN? (1):2
```

```
L4      31 ANSWERS HCAPLUS COPYRIGHT 2009 ACS on STN
```

```
IT      Herbicides  
        (sagebrush response to, soil moisture in relat
```

```
L4      31 ANSWERS HCAPLUS COPYRIGHT 2009 ACS on STN
```

```
IT      Artemisia frigida  
        Weed control  
        (management of fringed sagebrush in Saskatchewan)
```

```
IT      1702-17-6, Clopyralid 1918-02-1, Picloram 25168-26-7, 2,4-D  
        Isooctyl ester 55335-06-3, Triclopyr 67783-16-8  
        69377-81-7, Fluroxypyr 159467-88-6
```

```
RL: ARG (Analytical reagent use); BAC (Biological activity or effector,  
except adverse); BSU (Biological study, unclassified); ANST (Analytical  
study); BIOL (Biological study); USES (Uses)  
(management of fringed sagebrush in Saskatchewan)
```

```
HOW MANY MORE ANSWERS DO YOU WISH TO SCAN? (1):END
```

The (L) operator ensures that that the term "sagebrush" occurs in the text of the index entry.

Note the highlighting of the CAS RN. This is a result of searching with RTCS – the CAS RN is searched directly.

Controlled-term strategy

Alternatively, both concepts can be searched in the controlled vocabulary portion of the IT entry. In this case, the terms can only be linked using the AND operator. This results in more answers, but because each hit term may be in different index entries, less precision.

=> D SELECT

=> S E108+PFT,NT

L5 6656 ARTEMISIA+PFT,NT/CT (337 TERMS)

=> S (L2 OR L3) AND L5

L6 122 (L2 OR L3) AND L5

=> D SCAN HIT

L6 122 ANSWERS HCAPLUS COPYRIGHT 2009 ACS on STN

IT **Herbicides**

(activity of, determination of, by photosynthesis determination with oxygen electrode)

IT **Artemisia princeps**

Chenopodium album

●

●

●

(photosynthesis by, atrazine effect on, determination of)

IT 85-00-7 87-86-5 88-85-7 **101-21-3** **122-34-9**

151-50-8 314-40-9 **330-54-1** **330-55-2** **709-98-8**

1014-70-6 1397-94-0 1689-83-4 1698-60-8 1918-18-9

2307-68-8 4685-14-7 **7287-19-6** 20354-26-1 **21087-64-9**

25057-89-0 83653-17-2

RL: ANST (Analytical study)

(photosynthesis inhibition by, determination of, by oxygen electrode with leaf disks)

IT **1912-24-9**

RL: ANST (Analytical study)

(photosynthesis inhibition by, determination of, with oxygen electrode)

HOW MANY MORE ANSWERS DO YOU WISH TO SCAN? (1):1

L6 122 ANSWERS HCAPLUS COPYRIGHT 2009 ACS on STN

IT **Artemisia and(or) Sagebrush**

Chrysothamnus viscidiflorus

Halogeton glomeratus

Kochia

(control by monuron)

IT **Weed control**

(for Halogeton glomeratus and Chrysothamnus viscidiflorus by 3-(p-chlorophenyl)-1,1-dimethylurea)

HOW MANY MORE ANSWERS DO YOU WISH TO SCAN? (1):0

The D SELECT command will re-display the E-number select list.

note

Compare the results of this search with that of the initial Basic Index search. These answers were retrieved because of the inclusion of the term "artemisia" plus related terms, obtained through the CA Lexicon.

=> S L6 NOT L1

L7 83 L6 NOT L1

=> D SCAN HIT

L7 59 ANSWERS HCAPLUS COPYRIGHT 2006 ACS on STN

IT **Weed control**

(in ornamental plants, herbaceous-perennial,
phytotoxicity in relation to)

IT **Artemisia**

Aster

Campanula carpatica

●

●

●

Tradescantia

(weed control in, phytotoxicity in relation to)

IT **122-34-9** 957-51-7 1861-32-1 15299-99-7 **15972-60-8**

19044-88-3 19666-30-9 42576-02-3 42874-03-3

RL: BIOL (Biological study)

(weed control by, in herbaceous perennial ornamental
plants, phytotoxicity in relation to)

HOW MANY MORE ANSWERS DO YOU WISH TO SCAN? (1):1

L7 59 ANSWERS HCAPLUS COPYRIGHT 2006 ACS on STN

IT **Weed control**

(in wormwood)

IT **Absinthium**

(weed control in)

IT **330-55-2** 1918-16-7 3060-89-7

RL: BIOL (Biological study)

(weed control by, in wormwood)

HOW MANY MORE ANSWERS DO YOU WISH TO SCAN? (1):0

CA Lexicon strategy in the Basic Index

CA Lexicon terminology can also be used as search terms in the CPlus Basic Index or in the Basic Index of another database that does not have a subject term thesaurus.

=> SET POSTING OFF

SET COMMAND COMPLETED

These SET commands eliminate display of intermediate postings.

=> SET INTERPRET OFF

SET COMMAND COMPLETED

=> S (E7-E9/BI OR GROWTH INHIBIT? OR E28-E106/BI)

L8 216306 ("WEED CONTROL"/BI OR "WEED CONTROL (HERBICIDAL)"/BI OR WEEDICI DES/BI) OR GROWTH INHIBIT? OR (HERBICIDES/BI OR "HERBICIDES (L) SELECTIVE, SYNERGISTIC"/BI OR "HERBICIDES (L) SYNERGISTIC"/BI OR HERBICIDE/BI OR PHYTOCIDES/BI OR "SELECTIVE SYNERGISTIC HERBICIDES"/BI OR "SYNERGISTIC HERBICIDES"/BI OR "SYNERGISTIC PHYTOCIDES"/BI OR "SYNERGISTIC

●
●
●

The controlled term E-numbers are "re-qualified" to search in the Basic Index by typing /BI at the end of the E-number range.

=> S L8(L)E116-E452/BI

L9 301 L13(L) (ARTEMISIA/BI OR ABROTANUM/BI OR ABSINTHIUM/BI OR "ARTEMISIA AND(OR) SAGEBRUSH"/BI OR MUGWORT/BI OR ABSINTH/BI OR ARMOISE/BI OR OLIGOSPORUS/BI OR SAGEBRUSH/BI OR WORMWOOD/BI OR "ARTEMISIA ABROTANUM"/BI OR "ARTEMISIA ABSINTHIUM"/BI OR "ARTEMISIA ABYSSINICA"/BI OR "ARTEMISIA ADAMSII"/BI OR "ARTEMISIA AFRA"/BI OR "ARTEMISIA AKSAIENSIS"/BI OR "ARTEMISIA ALBA"/BI OR "ARTEMISIA ALBIDA"/BI OR "ARTEMISIA ALTAIENSIS"/BI OR "ARTEMISIA ANETHIFOLIA"/BI OR "ARTEMISIA ANETHOIDES"/BI OR "ARTEMISIA ANNUA"/BI OR "ARTEMISIA ANOMALA"/BI OR "ARTEMISIA APIACEA"/BI OR "ARTEMISIA ARARATICA"/BI OR "ARTEMISIA ARAXINA"/BI OR "ARTEMISIA ARBORESCENS"/BI OR "ARTEMISIA ARBUSCULA"/BI OR "ARTEMISIA ARBUSCULA ARBUSCULA"/BI OR "ARTEMISIA ARCTICA"/BI OR "ARTEMISIA ARENARIA"/BI OR "ARTEMISIA ARGENTEA"/BI OR "ARTEMISIA ARGYI"/BI OR "ARTEMISIA ARGYI GRACILIS"/BI OR "ARTEMISIA ARGYI QIAI"/BI OR "ARTEMISIA ARMENIACA"/BI OR "ARTEMISIA ASCHURBAJEVII"/BI OR "ARTEMISIA ASHURBAJEVII"/BI OR "ARTEMISIA ASIATIA"/BI

note

Compare the results of this search with that of the initial Basic Index search. These answers were retrieved because of the additional CA Lexicon vocabulary.

=> S L9 NOT L1

L10 258 L8 NOT L1

=> D SCAN HIT

HOW MANY MORE ANSWERS DO YOU WISH TO SCAN? (1):1

HOW MANY MORE ANSWERS DO YOU WISH TO SCAN? (1):1

L10 258 ANSWERS HCAPLUS COPYRIGHT 2009 ACS on STN
TI Uptake and translocation of selected **herbicides** in
mugwort
ST herbicide uptake translocation **Artemisia** ; fenac uptake
translocation **Artemisia** ; **simazine** uptake translocation
Artemisia ; amitrole uptake translocation **Artemisia**
IT Translocation, physiological
(of **herbicides** , by **Artemisia vulgaris**)

HOW MANY MORE ANSWERS DO YOU WISH TO SCAN? (1):1

L9 258 ANSWERS HCAPLUS COPYRIGHT 2009 ACS on STN
TI Growing trials with the common **wormwood** (**Artemisia**
absinthium L.). I. Method of propagation, spacing and
chemical **weed control**
IT **Weed control**
(in **wormwood**)
IT **Absinthium**
(**weed control** in)
IT 330-55-2 1918-16-7 3060-89-7
RL: BIOL (Biological study)
(**weed control** by, in **wormwood**)

HOW MANY MORE ANSWERS DO YOU WISH TO SCAN? (1):0

A Basic Index (/BI) search will sometimes not display an answer in SCAN mode, because the hit terms appeared only in the abstract.

Step 4: Display results

One technique for reviewing answers and extracting selected references is to

1. Enter the DISPLAY BROWSE feature
2. Mark the answers of interest (TAG)
3. Create an answer set of just the tagged answers of interest (SORT TAG)

Enter DISPLAY BROWSE

DISPLAY BROWSE is useful for reviewing the records in an answer set without rekeying the DISPLAY command repeatedly. To browse through the answers, do the following

- a) Type D BROWSE
- b) A colon prompt is returned, set a browse format to use, beginning with an asterisk
- c) Type a period or answer numbers at the colon prompt to review additional records.

```
=> D BROWSE L9

:*TI HITIND
:1

L9 ANSWER 1 OF 258 HCAPLUS COPYRIGHT 2009 ACS on STN
TI Effect of tillage systems and herbicides on weed infestation of maize
CC 5-3 (Agrochemical Bioregulators)
IT Amaranthus retroflexus
   Artemisia vulgaris
   Chenopodium album
   Corn
   Digitaria ischaemum
   Echinochloa crus-galli
   Erodium cicutarium
   Galinsoga parviflora
   Geranium pusillum
   Herbicides
   Polygonum aviculare
   Polygonum convolvulus
   Polygonum nodosum
   Setaria viridis
   Solanum nigrum
   Tillage
   Tripleurospermum maritimum inodorum
   Veronica persica
   Viola arvensis
   Weed control
   Zea mays
     (tillage systems and herbicides effect on weed
     infestation of maize)

:.

L9 ANSWER 2 OF 258 HCAPLUS COPYRIGHT 2009 ACS on STN
TI Biological organic fertilizer with effects of moisturizing and resisting
drought
CC 19-6 (Fertilizers, Soils, and Plant Nutrition)
:7
```

Mark the answers of interest

At the colon prompt, answers are marked using the term "TAG".

```
L9 ANSWER 7 OF 258 HCAPLUS COPYRIGHT 2009 ACS on STN
TI Degradation and ecotoxicity of the biomedical drug artemisinin in soil
CC 4-4 (Toxicology)
   Section cross-reference(s): 1, 11, 19, 61
:TAG
ANSWER 7 TAGGED

●
●
●

:20-21

L9 ANSWER 20 OF 258 HCAPLUS COPYRIGHT 2009 ACS on STN
TI RT-PCR detection of Apple mosaic virus infection in some weed hosts found
   in hazelnut orchards in Turkey
CC 3-1 (Biochemical Genetics)
   Section cross-reference(s): 10, 11
IT Apple mosaic virus
   Artemisia vulgaris
   Bean
   Campanula
   Clematis vitalba
   Galeopsis
   Phaseolus vulgaris
   Prunella (plant)
   Rubus canescens
   Salvia verbenaca
   Scandix
   (detection of Apple mosaic virus in bean plants previously inoculated
   with exts. of weed plants from hazelnut orchards in Turkey
   using RNA 3-specific RT-PCR)

L9 ANSWER 21 OF 258 HCAPLUS COPYRIGHT 2009 ACS ON STN
TI screening botanical herbicide for invasive plant ipomoea cairica
CC 5-3 (Agrochemical Bioregulators)
IT Ageratum Conyzoides
   Allelopathy
   Artemisia Annua
   Chromolaena Odorata
   Eucalyptus Exserta
   Eupatorium Catarium
   Herbicides
   Ipomoea Cairica
   Lantana Camara
   Ligularia Virgaurea
   Mikania Micrantha
   Paederia Foetida
   Thermopsis Lupinoides
   Vitex Negundo
   Wedelia Trilobata
   (screening botanical herbicide for invasive plant ipomoea
   cairica)

:TAG 20
ANSWER 20 TAGGED
:END
```

Create a set of answers of interest

The SORT command is used to rearrange records in an answer set. To create an answer set of tagged answers, do the following

- Type SORT TAG
- Type a field on which to sort (e.g., publication year PY)
- Type a sort direction: A = ascending; D = descending

```
=> SORT L9 TAG
```

```
ENTER SORT FIELDS AND SORT DIRECTION (?):PY D  
PROCESSING COMPLETED FOR L9  
L10          5 SORT L9 TAG PY D
```

*The tagged answers will be
arranged in reverse
chronological order.*

Display in more complete detail

```
=> D BIB ABS HITIND TOTAL
```

```
L10 ANSWER 1 OF 5 HCAPLUS COPYRIGHT 2009 ACS on STN  
AN 2009:392129 HCAPLUS Full-text  
DN 150:367985  
TI Degradation and ecotoxicity of the biomedical drug artemisinin in soil  
AU Jessing, Karina K.; Cedergreen, Nina; Jensen, John; Hansen, Hans C. B.  
CS Department of Basic Sciences and Environment, University of Copenhagen,  
Frederiksberg C, 1870, Den.  
SO Environmental Toxicology and Chemistry (2009), 28(4), 701-710  
CODEN: ETOCDK; ISSN: 0730-7268  
PB SETAC Press  
DT Journal  
LA English  
AB The plant Artemisia annua L. is cropped in many countries for production  
of the antimalarial drug artemisinin. Artemisinin is phytotoxic and has  
insecticidal activity. Large-scale cultivation of A. annua may cause  
transfer of artemisinin to soil and, hence, may affect both soil organisms  
and the aquatic environment if the compound is leachable. In the present  
study, a new method for extraction of artemisinin from soil was developed,  
and field concns. and degradation kinetics of artemisinin in sandy and loamy  
soils were measured. The soil concns. in a Danish A. annua field were up to  
11.7 mg/kg. The degradation kinetics could be modeled as the sum of two  
first-order reactions, a fast initial degradation followed by a reaction  
  
●  
●  
●  
  
CC 4-4 (Toxicology)  
Section cross-reference(s): 1, 11, 19, 61  
RE.CNT 41 THERE ARE 41 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT
```

Skills Practice

1. For what time period was *maple* a valid index term? What is its earliest reference? What is the present valid index term?
2. What chemical substances have been linked to detergents?
3. Find references on stable polymorphs related to pharmaceutical dosage forms.

Analyze Controlled Terminology

Another way to identify terminology for use in search strategy development is to extract the controlled terminology from the results of a preliminary Basic Index search and identify alternatives from there. This is a useful technique when a technology area is new or unfamiliar.

Search Question: *Locate information on G-protein-coupled receptor signaling.*

Preliminary Basic Index search

```
=> FILE HCAPLUS
=> S (G (S) PROTEIN (S) COUPL? (S) RECEPTOR OR GPCR) (S) SIGNAL?
L1          6776 (G (S) PROTEIN (S) COUPL? (S) RECEPTOR OR GPCR) (S) SIGNAL?
```

Though 6,776 answers are significant, a richer, more thorough search of the technology area is possible using controlled terminology.

Search Strategy

To identify terminology in an unfamiliar technology area

- Step 1 Rearrange the answer set in relevance order
- Step 2 Extract the controlled terminology from the most relevant answers
- Step 3 View the hierarchy of associated controlled terminology for each term
- Step 4 Search on the controlled terminology
- Step 5 Display results

Step 1: Rearrange the answer set in relevance order

The FOCUS command is used to rearrange answers based on relevance.

```
=> FOCUS L1  
  
PROCESSING COMPLETED FOR L1  
L2          6776 FOCUS L1 1-
```

Step 2: Extract the controlled terminology from the most relevant answers

The ANALYZE command is used to extract the controlled terminology from the index terms.

```
=> ANALYZE L2 1-1000 CT  
  
L3          ANALYZE L2 1-1000 CT :      1054 TERMS  
  
=> D  
  
L3          ANALYZE L2 1-1000 CT :      1054 TERMS  
  
TERM #      # OCC  # DOC  % DOC CT  
-----  
1           696   662   66.20 G PROTEIN-COUPLED RECEPTORS  
2           660   418   41.80 G PROTEINS (GUANINE NUCLEOTIDE-BINDING PROTEINS)  
3           639   637   63.70 SIGNAL TRANSDUCTION, BIOLOGICAL  
4           279   151   15.10 PROTEINS  
5           220   220   22.00 SIGNAL TRANSDUCTION  
6           218   218   21.80 HUMAN  
7           150   117   11.70 RECEPTORS  
8           126   111   11.10 BIOLOGICAL TRANSPORT  
9           123   118   11.80 PHOSPHORYLATION, BIOLOGICAL  
10          103    45    4.50 GENE, ANIMAL
```

Only the 1,000 most relevant records are analyzed.

note

There is a limit of 50,000 terms that may be extracted using ANALYZE.

A fee is associated with using the ANALYZE command. It is based on the number of records analyzed. For a link to the current STN price list, go to the CAS web site at www.cas.org/products/stnfamily/
For more information, see

```
=> HELP ANALYZE
```

Step 3: View the hierarchy of associated controlled terminology for each term

=> SET EXPAND CONTINUOUS

SET COMMAND COMPLETED

=> SEL 1-3,5

E1 THROUGH E4 ASSIGNED

=> D SEL

E1	696	G PROTEIN-COUPLED RECEPTORS/CT
E2	660	G PROTEINS (GUANINE NUCLEOTIDE-BINDING PROTEINS)/CT
E3	639	SIGNAL TRANSDUCTION, BIOLOGICAL/CT
E4	220	SIGNAL TRANSDUCTION/CT

*SELECT terms from the
ANALYZE list to create
searchable E-terms.*

=> E E1+ALL

E5	13130	BT4 Chemical compounds/CT
E6	12359	BT3 Macromolecular compounds/CT
E7	13130	BT4 Chemical compounds/CT
E8	51837	BT3 Organic compounds/CT
E9	1055547	BT2 Proteins/CT
E10	258229	BT1 Receptors/CT
E11	11337	--> G protein-coupled receptors/CT HNTE Valid heading during volume 126 (1997) to present. NOTE A large family of cell surface membrane receptors whose signal transduction is mediated by heterotrimeric G proteins. All these receptors have seven transmembrane domains.
E12		OLD Receptors (L) G protein-coupled/CT
E13		UF 7-Transmembrane receptors/CT
E14		UF GPCR/CT
E15		UF GPCRs/CT
E16	672	NT1 Bombesin receptors/CT
E17	921	NT1 Calcitonin gene-related peptide receptors/CT
E18	564	NT1 Calcitonin receptors/CT
E19	379	NT1 Calcium-sensing receptors/CT
E20	2088	NT1 Corticotropin releasing factor receptors/CT
E21	637	NT1 Galanin receptors/CT
E22	518	NT1 Glucagon receptors/CT
E23	743	NT1 Glucagon-like peptide-1 receptors/CT
E24	38	NT1 Glucagon-like peptide-2 receptors/CT
E25	87	NT1 Glucose-dependent insulinotropic polypeptide receptors/CT
E26	1692	NT1 Gonadotropin receptors/CT
E27	961	NT2 FSH receptors/CT
E28	9	NT1 Gonadotropin-releasing hormone II receptors/CT
E29	323	NT1 Gonadotropin-releasing hormone receptors/CT
E30	755	NT1 Growth hormone secretagogue receptors/CT
E31	434	NT1 Growth hormone-releasing hormone receptors/CT
E32	46	NT1 Lysophospholipid receptors/CT
E33	247	NT2 Lysophosphatidic acid receptors/CT
E34	480	NT2 Sphingosine-1-phosphate receptors/CT
E35	450	NT1 Melanin-concentrating hormone receptors/CT

•
•
•

=> E E3+ALL

E64 155895 --> Signal transduction, biological/CT
HNTTE Valid heading during volumes 116-145 (1992-2006) only.
E65 225846 NEW Signal transduction/CT
***** END *****

=> E E65+ALL

E66 0 BT1 Biological processes and phenomena (non-CA heading)/CT
E67 225846 --> Signal transduction/CT
HNTTE Valid heading during volume 146 (2007) to present.
E68 155895 OLD Signal transduction, biological/CT
E69 UF Biol. signal transduction/CT
E70 UF Biol. signaling/CT
E71 UF Biological signal transduction/CT
E72 UF Cellular signaling/CT
E73 UF Cellular signalling/CT
E74 UF Signal pathways/CT
E75 UF Signal transduction (biological)/CT
E76 UF Signaling/CT
E77 UF Signaling mechanism/CT
E78 UF Signaling network/CT
E79 UF Signaling networks/CT
E80 UF Signaling pathways/CT
E81 UF Signaling transduction/CT
E82 UF Signalling/CT
E83 UF Signalling network/CT
E84 UF Signalling pathways/CT
E85 1650 NT1 Quorum sensing/CT
E86 4864 NT1 Second messenger system/CT
E87 300793 RT Biological transport/CT
E88 18070 RT Electron transport system, biological/CT
E89 879 RT Intercellular communication/CT
E90 55883 RT Neurotransmission/CT
E91 90792 RT Phosphorylation, biological/CT
E92 RT Phosphorylation, biological (L) protein/CT
E93 258229 RT Receptors/CT
E94 5488 RT Remodeling/CT
E95 RTCS Adenosine cyclic 3',5'-monophosphate/CT
E96 RTCS Adenylate cyclase/CT
E97 RTCS C-Jun N-terminal kinase/CT
E98 RTCS Calcium-calmodulin-dependent protein kinase II/CT
E99 RTCS D-myo-Inositol 1,4,5-trisphosphate/CT
E100 RTCS D-myo-Inositol 1-phosphate/CT
E101 RTCS EGF receptor kinase/CT
E102 RTCS Focal adhesion kinase/CT
E103 RTCS Guanosine triphosphatase/CT
E104 RTCS Guanylate cyclase/CT

●
●
●

Step 4: Search the controlled terminology

```
=> S E11+OLD,NT
```

```
L4          42770 "G PROTEIN-COUPLED RECEPTORS"+OLD,NT/CT  (48 TERMS)
```

```
=> S E67+OLD,NT,RTCS
```

```
L5          391020 "SIGNAL TRANSDUCTION"+OLD,NT,RTCS/CT  (39 TERMS)
```

```
=> S L4 AND L5
```

```
L6          12065 L4 AND L5
```

note

Compare the results of the controlled terminology search with that of the initial Basic Index search

```
=> S L6 NOT L1
```

```
L7          9038 L6 NOT L1
```

```
=> D SCAN HIT
```

```
L7  9038 ANSWERS  HCAPLUS  COPYRIGHT 2009 ACS on STN
```

```
IT  Cilia  
    Development, nonmammalian postembryonic  
    Olfaction
```

```
    Signal transduction, biological
```

```
    Taste
```

```
    (Drosophila regulatory factor X is necessary for ciliated sensory  
    neuron differentiation)
```

```
IT  Mechanoreceptors
```

```
    Olfactory receptors
```

```
    Taste receptors
```

```
    RL: BSU (Biological study, unclassified); BIOL (Biological study)
```

```
    (Drosophila regulatory factor X is necessary for ciliated sensory  
    neuron differentiation)
```

```
HOW MANY MORE ANSWERS DO YOU WISH TO SCAN? (1):1
```

```
L7  9038 ANSWERS  HCAPLUS  COPYRIGHT 2009 ACS on STN
```

```
IT  G protein-coupled receptors
```

```
    RL: BSU (Biological study, unclassified); BIOL (Biological study)  
    (GPCR8; erythropoietin induces changes in gene expression in PC-12  
    cells)
```

```
IT  Apoptosis
```

```
    Cell differentiation
```

```
    Cell proliferation
```

```
    Signal transduction, biological
```

```
    Signal transduction, biological
```

```
    Transcription, genetic
```

```
    (erythropoietin induces changes in gene expression in PC-12 cells)
```



Step 5: Display results

=> S L6 OR L1

L8 15814 L6 OR L1

=> D SCAN HIT

L8 15814 ANSWERS HCAPLUS COPYRIGHT 2009 ACS on STN

TI **Signaling** and regulation of **G protein - coupled receptors** in airway smooth muscle

HOW MANY MORE ANSWERS DO YOU WISH TO SCAN? (1):1

L8 15814 ANSWERS HCAPLUS COPYRIGHT 2009 ACS on STN

IT **G protein-coupled receptors**

RL: ADV (Adverse effect, including toxicity); BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study)

(ORF74; G protein-coupled receptor encoded by rhesus rhadinovirus is similar to ORF74 of Kaposi's sarcoma-associated herpesvirus)

IT **Signal transduction, biological**

(activation of ERK1/2 mitogen-activated **protein kinase pathway by G protein -coupled receptor** in rhesus rhadinovirus-infected cells)

IT **137632-07-6** , ERK1 kinase **137632-08-7** , ERK2 kinase

RL: BSU (Biological study, unclassified); BIOL (Biological study)

(activation of ERK1/2 mitogen-activated protein kinase pathway by G protein-coupled receptor in rhesus rhadinovirus-infected cells)

HOW MANY MORE ANSWERS DO YOU WISH TO SCAN? (1):**END**

The Basic Index and controlled terminology answer sets are combined for a comprehensive answer set.

REFINEMENT TECHNIQUES

In this section, you will learn to refine CAplus answer sets using the following categorization schemes

- International patent classification codes
- CA section codes

Refinement Techniques

There are a number of common ways to refine large answer sets

- Adding an additional concept
- Searching specialized indexes such as
 - ◆ Document type (DT)
 - ◆ Publication year (PY)

Additional refinement techniques are available for improving CPlus subject search results. These include

- Using patent classification as a way to identify patents in a particular area of technology
- Using CA section placement as a way to identify research papers in a particular area of technology

International Patent Classification Codes

The International Patent Classification (IPC) is used by patent-issuing authorities to classify and index the subject matter of published patents.

IPCs can be used as part of a search strategy to identify patents in a particular area of technology. It can be used to refine a search and identify easily and accurately the patents on a specific topic or in a given area of technology.

Search with IPCs

The CAplus database contains IPCs in the IPC field. A thesaurus is available to identify IPC definitions.

Illustration

```
=> E C10M0105-00+ALL/IPC

E1          0   BT3   C1/IPC
E2          0   BT2   C10/IPC
                PETROLEUM, GAS OR COKE INDUSTRIES; TECHNICAL GASES
                CONTAINING CARBON MONOXIDE; FUELS; LUBRICANTS;
                PEAT
E3         42003   BT1   C10M/IPC
                LUBRICATING COMPOSITIONS (well drilling
                Compositions C09K0008-02); USE OF CHEMICAL
                SUBSTANCES EITHER ALONE OR AS LUBRICATING
                INGREDIENTS IN A LUBRICATING COMPOSITION (mould
                release, i.e. separating, agents for metals
                B22C0003-00, for plastics or substances in a
                ●
                ●
                ●
```

Search Strategy

To refine an answer set using IPCs

- Step 1 Refine the answer set to patents only
- Step 2 Identify the "correct" IPC code
- Step 3 Verify the IPC code
- Step 4 Refine using the IPC code

note

Use this search strategy

```
=> FILE HCAPLUS
=> S (LUBRICATING OILS OR "LUBRICATING OIL ADDITIVES")
=> S L1 AND PHOSPHORUS
```

It will be the starting point for illustrating the refinement techniques.

Step 1: Refine the answer set to patents only

```
=> S L2 AND PATENT/DT
L3          1440 L2 AND PATENT/DT
```

Step 2: Identify the "correct" IPC code

Determining the "correct" IPC code can be accomplished a number of ways. Strategies include

- Analyzing the IPC codes used in a patent answer set
- Identifying the IPC codes used to classify one or two "good examples"

Analyze the IPC codes

=> ANALYZE L3 1- IPC

L4 ANALYZE L3 1- IPC : 2336 TERMS

=> D DOC

L4 ANALYZE L3 1- IPC : 2336 TERMS

TERM #	# OCC	# DOC	% DOC	IPC
1	2435	580	40.28	C10M0137-00
2	1546	391	27.15	C10M0159-00
3	1519	388	26.94	C10N0030-06
4	1461	371	25.76	C10M0137-10
5	1701	360	25.00	C10M0169-00
6	1102	358	24.86	C07F0009-00
7	1583	322	22.36	C10M0169-04
8	1445	318	22.08	C10M0135-00
9	1550	312	21.67	C10M0141-00
10	1210	301	20.90	C10M0133-00

When displaying an ANALYZED set of IPC codes, display by DOC order.

=> D OCC

L4 ANALYZE L3 1- IPC : 1902 TERMS

TERM #	# OCC	# DOC	% DOC	IPC
1	2782	31	2.15	C10G0045-00
2	2450	38	2.64	B01J0037-00
3	2435	580	40.28	C10M0137-00
4	2092	49	3.40	C10G0045-02
5	1836	196	13.61	C10M0163-00
6	1820	37	2.57	C10G0045-04
7	1701	360	25.00	C10M0169-00
8	1583	322	22.36	C10M0169-04
9	1550	312	21.67	C10M0141-00
10	1546	391	27.15	C10M0159-00

The default display is by occurrence, and with all of the additional IPC reclassification information in the database, it can give a skewed view of the IPC codes.

Step 3: Verify the IPC code

The IPC thesaurus can be used to explore further the definitions of patent classifications.

```
=> SET EXPAND CONTINUOUS

SET COMMAND COMPLETED

=> E C10M0137-10/IPC

E#    FREQUENCY    AT    TERM
--    -
E1      289        2    C10M0137-06/IPC
E2      474        2    C10M0137-08/IPC
E3     2251        2 --> C10M0137-10/IPC
E4      412        2    C10M0137-12/IPC
E5      226        2    C10M0137-14/IPC
E6      137        2    C10M0137-16/IPC
E7     1417        2    C10M0139/IPC
E8     1405       103    C10M0139-00/IPC
E9       58        2    C10M0139-02/IPC
E10     185        2    C10M0139-04/IPC
E11     135        2    C10M0139-06/IPC
E12       1        2    C10M0139-16/IPC
```

=> E E3+TI

Expanding on an IPC plus TITLES gives a summary of the term and all of the broader terms.

```
E13          0   BT6   C1/IPC
E14          0   BT5   C10/IPC
                PETROLEUM, GAS OR COKE INDUSTRIES; TECHNICAL GASES
                CONTAINING CARBON MONOXIDE; FUELS; LUBRICANTS; PEAT
E15          42003 BT4   C10M/IPC
                LUBRICATING COMPOSITIONS (well drilling compositions
                C09K0008-02); USE OF CHEMICAL SUBSTANCES EITHER ALONE
                OR AS LUBRICATING INGREDIENTS IN A LUBRICATING
                COMPOSITION (mould release, i.e. separating, agents for
                metals B22C0003-00, for plastics or substances in a
                plastic state, in general B29C0033-56, for glass
                C03B0040-02; textile lubricating compositions
                D06M0011-00, D06M0013-00, D06M0015-00; use of
                particular substances in particular apparatus or
                conditions, see F16N or the relevant groups for the
                application, e.g. A21D0008-08, B21C0009-00,
                H01B0003-18; immersion oils for microscopy G02B0021-33)
E16          3988  BT3   C10M0137-00/IPC
                Lubricating compositions characterised by the additive
                being an organic non-macromolecular compound containing
                phosphorus
                CORE
                VALID FROM 19850101 TO PRESENT ( IPC EDITION: 4-8 )
E17          778  BT2   C10M0137-02/IPC
                . having no phosphorus-to-carbon bond
                ADVANCED
                VALID FROM 19850101 TO PRESENT ( IPC EDITION: 4-8 )
E18          1397 BT1   C10M0137-04/IPC
                . . Phosphate esters
                ADVANCED
                VALID FROM 19850101 TO PRESENT ( IPC EDITION: 4-8 )
E19          2251 --> C10M0137-10/IPC
                . . . Thio derivatives
                ADVANCED
                VALID FROM 19850101 TO PRESENT ( IPC EDITION: 4-8 )
***** END *****
```

note

The ALL relationship code can be used to view an entire IPC definition.
Warning! This can be a very long display.

```
=> E E3+ALL
```

Type HELP RCODES to see all valid thesaurus relationship codes for
CAplus.

Step 4: Refine using the IPC code

Relationship codes can be used in a search query. In this case, a broader term plus all of the narrower terms were used.

=> S L2 AND E16+NT

4147 C10M0137-00+NT/IPC (9 TERMS)
L5 596 L2 AND C10M0137-00+NT/IPC

=> D SCAN TI IPC HIT

L5 596 ANSWERS HCAPLUS COPYRIGHT 2009 ACS on STN
TI Lubricating oil compositions
IC ICM C10M141-12
ICI C10M141-12, C10M135-18, C10M137-10, C10M139-00; C10N010-04, C10N010-12, C10N040-04, C10N040-08, C10N040-25
IT **Lubricating oil additives**
(lubricating oil compns. contg. molybdenum thiocarbamates and Zn thiophosphates and B-contg. succinimide for engines for low friction coeff.)
IT 7439-98-7, Molybdenum, uses 7440-42-8, Boron, uses 7723-14-0,
Phosphorus, uses
RL: MOA (Modifier or additive use); USES (Uses)
(controlled; lubricating oil compns. contg. molybdenum thiocarbamates and Zn thiophosphates and B-contg. succinimide for engines for low friction coeff.)

HOW MANY MORE ANSWERS DO YOU WISH TO SCAN? (1):1

L5 596 ANSWERS HCAPLUS COPYRIGHT 2009 ACS on STN
TI Power transmitting fluids with improved shift durability
IC ICM C10M141-10
ICS C10M163-00; C10M169-04
IT **Lubricating oil additives**
(antifriction; power transmitting fluids with improved shift durability contg. full or partial esters of mono- or polycarboxylic acids)
IT Terpenes, uses
RL: MOA (Modifier or additive use); USES (Uses)
(phosphorus pentasulfide-treated, antioxidants; power transmitting fluids with improved shift durability contg.)
IT Amines, uses
RL: MOA (Modifier or additive use); USES (Uses)
(reaction products with hydroxy-substituted phosphorothioic triesters and **phosphorus** reagent; power transmitting fluids with improved shift durability)
IT 15834-33-0D, Phosphorodithioic acid, esters, reaction products with aliph. primary amines and **phosphorus** reagent, uses
RL: MOA (Modifier or additive use); USES (Uses)
(power transmitting fluids with improved shift durability)
IT 289-06-5D, 1,3,4-Thiadiazole, mercapto- and hydrocarbyldithio derivs. 1314-80-3D, **Phosphorus** pentasulfide, reaction products with terpene derivs.
RL: MOA (Modifier or additive use); USES (Uses)
(power transmitting fluids with improved shift durability contg.)

HOW MANY MORE ANSWERS DO YOU WISH TO SCAN? (1):0

CA Section Codes

CA section codes are used by CAS to classify and index document references.

Originally, section assignment was used to locate similar document references in print *CA*. This assignment can also be used as part of a search strategy to identify research papers in a particular area of technology. It can be used to refine a search and identify easily and accurately the references on a specific topic or in a given area of technology.

Search with CA Section Codes

Recall: The CPlus database contains CA section codes in the classification code (CC) field.

Illustration

Section codes are searchable in the CC field. Cross-reference section codes are searchable in the SX field.

```
CC 29-13 (Organometallic and Organometalloidal Compounds)
Section cross-reference(s): 22, 75, 73, 76
```

The content of some CA sections has changed over time as CAS has adjusted section groupings to reflect best the major subdivisions of chemistry. These changes can be easily and efficiently determined using the CA section code thesaurus.

Search Strategy

To refine an answer set using CA section codes

- Step 1 Identify the "correct" CA section code
- Step 2 Verify the CA section code
- Step 3 Refine using the CA section code

Step 1: Identify the "correct" CA section code

Determining the "right" CA section code can be accomplished a number of ways. Strategies include

- Analyzing the CA section codes used in a CPlus answer set
- Identifying the CA section code assignment used to classify one or two "good examples"

Analyze the CA section codes

=> ANA L5 CC

L6 ANALYZE L5 1- CC : 26 TERMS

=> D

L6 ANALYZE L5 1- CC : 26 TERMS

TERM #	# OCC	# DOC	% DOC	CC
1	485	485	81.38	51-8
2	44	44	7.38	51-7
3	20	20	3.36	22
4	10	10	1.68	29-7
5	9	9	1.51	51
6	3	3	0.50	27
7	2	2	0.34	10
8	2	2	0.34	25
9	2	2	0.34	35-8
10	2	2	0.34	51-11

Section 51-8 is the most highly posted classification section. Begin at the top-most level in the section code thesaurus.

Step 2: Verify the CA section code

The CAplus section code thesaurus can be used to explore further the definitions and history of CA section code assignments.

=> SET EXPAND CONTINUOUS

SET COMMAND COMPLETED

=> DEL SEL Y

=> E 51+ALL/CC

```
E1      428246  --> 51/CC
E2      6819    USE  51 CELLULOSE, LIGNIN, PAPER, AND OTHER WOOD PRODUCTS,
        1963-1966/CC
E3      391020  USE  51 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS,
        1974 TO PRESENT/CC
E4      29794   USE  51 PETROLEUM, PETROLEUM DERIVATIVES, AND RELATED
        PRODUCTS, 1967-1973/CC
E5      613     USE  51 PROPELLANTS AND EXPLOSIVES, 1962 ONLY/CC
***** END *****
```

DELETE SELECT YES—erases a select list when EXPAND CONTINUOUS is on. Look for a Classification which is used TO PRESENT.

=> E E3+ALL

```
E6      6495105 BT1  APPLIED/CC
E7      391020  --> 51 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS,
        1974 TO PRESENT/CC
        NOTE THIS SECTION INCLUDES THE GEOCHEMISTRY, PROSPECTING,
        RECOVERY, REFINING, AND USES OF FOSSIL FUELS,
        PETROLEUM AND COAL; REFINING, TREATMENT, AND USES OF
        FOSSIL FUEL PRODUCTS AND THEIR DERIVATIVES (E.G.,
        GASOLINE, LUBRICANTS, ASPHALT, SYNTHESIS GAS FROM
        COAL); ANALYSIS, PROPERTIES, CATALYSTS FOR
        PRODUCTION OF HYDROCARBON FUELS AND RELATED
        PRODUCTS, AND SAFETY ASPECTS OF FOSSIL FUELS AND
        THEIR DERIVATIVES; AND DRILLING FLUIDS, OIL
        ADDITIVES, ANTIFREEZE COMPOSITIONS, SYNTHETIC
        LUBRICANTS, HYDRAULIC FLUIDS, CUTTING OILS, AND THE
        PRODUCTION OF HYDROCARBON FUELS FROM CARBON MONOXIDE
        AND HYDROGEN. FLAME STUDIES AND COMBUSTION OF FOSSIL
        FUELS ARE INCLUDED IN THIS SECTION. TREATMENT OF
        AUTOMOTIVE EXHAUST GASES AND STACK GASES IS INCLUDED
        IN SECTION 59; PAVING COMPOSITIONS IN SECTION 58;
        AND MANUFACTURE OF INDUSTRIAL CHEMICALS FROM
        PETROLEUM IN SECTION 45.
        HNTE SUBJECT WAS COVERED IN BROADER SECTIONS 22
        PETROLEUM, LUBRICANTS, ASPHALT, AND WOOD PRODUCTS,
        1923-1939, 22 PETROLEUM, ASPHALT, AND WOOD PRODUCTS,
        1914-1922, 22 PETROLEUM, ASPHALT, COAL TAR, AND WOOD
        PRODUCTS, 1912-1913, 22 PETROLEUM, ASPHALT, COAL,
        TAR, AND WOOD PRODUCTS, 1911 ONLY, 23 PETROLEUM,
        TURPENTINE, ASPHALT, AND WOOD PRODUCTS, 1910 ONLY,
        AND 22 PETROLEUM, TURPENTINE, ASPHALT, AND WOOD
        PRODUCTS, 1906-1909.
E8      21235   OLD  21 FUELS AND CARBONIZATION PRODUCTS, 1940-1956/CC
E9      9427   OLD  21 FUELS AND COAL PRODUCTS, 1957-1961/CC
E10     7292   OLD  21 FUELS, GAS, AND COKE, 1906-1909/CC
E11     2683   OLD  21 FUELS, GAS, AND COKE, 1911-1913/CC
E12     40517  OLD  21 FUELS, GAS, TAR, AND COKE, 1914-1939/CC
```

(continued on next page)

E13	564	OLD	22 FUELS, GAS, AND COKE, 1910 ONLY/CC
E14	3501	OLD	22 PETROLEUM, ASPHALT, AND WOOD PRODUCTS, 1914-1922/CC
E15	1059	OLD	22 PETROLEUM, ASPHALT, COAL TAR, AND WOOD PRODUCTS, 1912-1913/CC
E16	443	OLD	22 PETROLEUM, ASPHALT, COAL, TAR, AND WOOD PRODUCTS, 1911 ONLY/CC
E17	41923	OLD	22 PETROLEUM, LUBRICANTS, AND ASPHALT, 1940-1961/CC
E18	27456	OLD	22 PETROLEUM, LUBRICANTS, ASPHALT, AND WOOD PRODUCTS, 1923-1939/CC
E19	956	OLD	22 PETROLEUM, TURPENTINE, ASPHALT, AND WOOD PRODUCTS, 1906-1909/CC
E20	279	OLD	23 PETROLEUM, TURPENTINE, ASPHALT, AND WOOD PRODUCTS, 1910 ONLY/CC
E21	4765	OLD	26 COAL AND COAL DERIVATIVES, 1963-1966/CC
E22	14804	OLD	27 PETROLEUM AND PETROLEUM DERIVATIVES, 1963-1966/CC
E23	29794	OLD	51 PETROLEUM, PETROLEUM DERIVATIVES, AND RELATED PRODUCTS, 1967-1973/CC
E24	8101	OLD	52 COAL AND COAL DERIVATIVES, 1967-1973/CC
E25	3686	OLD	52 PETROLEUM AND PETROLEUM DERIVATIVES, 1962 ONLY/CC
E26	1594	OLD	53 COAL AND COAL DERIVATIVES, 1962 ONLY/CC
E27	0	NT1	51-0 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1972 TO PRESENT, REVIEWS/CC
E28	0	NT1	51-1 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1972-1981, GENERAL AND GEOCHEMISTRY OF PETROLEUM/CC
E29	0	NT1	51-1 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1982 TO PRESENT, PETROLEUM GEOCHEMISTRY AND PROSPECTING/CC
E30	0	NT1	51-10 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1972 TO PRESENT, PETROLEUM RESIDUES/CC
E31	0	NT1	51-11 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1972 TO PRESENT, SPECIAL PRODUCTS FROM PETROLEUM/CC
E32	0	NT1	51-12 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1972 TO PRESENT, COMBUSTION OF PETROLEUM SUBSTANCES AND NATURAL GAS/CC
E33	0	NT1	51-13 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1972-1981, CHEMICAL ENGINEERING/CC
E34	0	NT1	51-13 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1982 TO PRESENT, OIL-SHALE TECHNOLOGY/CC
E35	0	NT1	51-14 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1972-1981, SHALE PROCESSING/CC
E36	0	NT1	51-14 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1982 TO PRESENT, TAR-SANDS TECHNOLOGY/CC
E37	0	NT1	51-15 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1972-1981, TAR SANDS PROCESSING/CC
E38	0	NT1	51-15 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1982-1986, GENERAL STUDIES ON COAL/CC
E39	0	NT1	51-15 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1987 TO PRESENT, GENERAL STUDIES ON COAL AND LIGNITE (BROWN COAL)/CC
E40	0	NT1	51-16 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1972-1981, GENERAL STUDIES ON COAL/CC
E41	0	NT1	51-16 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1982-1986, COAL ANALYSIS AND PROPERTIES/CC
E42	0	NT1	51-16 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1987 TO PRESENT, COAL AND LIGNITE (BROWN COAL) ANALYSIS AND PROPERTIES/CC
E43	0	NT1	51-17 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1972-1981, CLASSIFICATION OF COAL/CC

(continued on next page)

E44	0	NT1	51-17 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1982-1986, COAL PREPARATION/CC
E45	0	NT1	51-17 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1987 TO PRESENT, COAL AND LIGNITE (BROWN COAL) PREPARATION/CC
E46	0	NT1	51-18 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1972-1981, ANALYSIS AND COMPOSITION OF COAL/CC
E47	0	NT1	51-18 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1982-1986, COAL COMBUSTION/CC
E48	0	NT1	51-18 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1987 TO PRESENT, COAL AND LIGNITE (BROWN COAL) COMBUSTION, INCLUDING AQUEOUS AND OIL SLURRIES/CC
E49	0	NT1	51-19 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1972-1981, CHEMICAL PROPERTIES OF COAL/CC
E50	0	NT1	51-19 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1982-1986, COAL CARBONIZATION AND PRODUCTS/CC
E51	0	NT1	51-19 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1987 TO PRESENT, COAL AND LIGNITE (BROWN COAL) CARBONIZATION AND PRODUCTS/CC
E52	0	NT1	51-2 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1972 TO PRESENT, PETROLEUM PRODUCTION/CC
E53	0	NT1	51-20 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1972-1981, PHYSICAL PROPERTIES OF COAL/CC
E54	0	NT1	51-20 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1982-1986, COAL GASIFICATION/CC
E55	0	NT1	51-20 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1987 TO PRESENT, COAL AND LIGNITE (BROWN COAL) GASIFICATION/CC
E56	0	NT1	51-21 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1972-1981, PREPARATION OF COAL/CC
E57	0	NT1	51-21 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1982-1986, COAL HYDROGENATION, LIQUEFACTION, AND REACTIONS/CC
E58	0	NT1	51-21 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1987 TO PRESENT, COAL AND LIGNITE (BROWN COAL) HYDROGENATION, LIQUEFACTION, AND REACTIONS/CC
E59	0	NT1	51-22 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1972-1981, STORAGE OF COAL/CC
E60	0	NT1	51-22 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1982-1986, LIGNITE, PEAT, AND BROWN COAL/CC
E61	0	NT1	51-22 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1987 TO PRESENT, PEAT, ASPHALTITES AND ASPHALTOIDS, AND LIGNITE (BROWN COAL) FORMATION, DEPOSITS, AND GENERAL STUDIES/CC
E62	0	NT1	51-23 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1972-1981, BRIQUETTING/CC
E63	0	NT1	51-23 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1982 TO PRESENT, GENERAL ENGINEERING STUDIES (COAL AND PETROLEUM)/CC
E64	0	NT1	51-24 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1972-1981, COMBUSTION, EXCLUDING PHYSICOCHEMICAL STUDIES OF GASES/CC
E65	0	NT1	51-24 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1982 TO PRESENT, OTHER (COAL AND PETROLEUM)/CC
E66	0	NT1	51-25 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1972-1981, CARBONIZATION AND ITS PRODUCTS/CC

(continued on next page)

E67	0	NT1	51-26 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1972-1981, COAL GASIFICATION/CC
E68	0	NT1	51-27 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1972-1981, GAS PURIFICATION/CC
E69	0	NT1	51-28 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1972-1981, HYDROGENATION/CC
E70	0	NT1	51-29 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1972-1981, CONVERSION/CC
E71	0	NT1	51-3 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1972-1981, PETROLEUM PROCESSING BEFORE CONVERSION/CC
E72	0	NT1	51-3 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1982 TO PRESENT, PETROLEUM ANALYSIS AND PROPERTIES/CC
E73	0	NT1	51-30 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1972-1981, MINE GASES/CC
E74	0	NT1	51-31 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1972-1981, LIGNITE, PEAT, AND BROWN COAL/CC
E75	0	NT1	51-4 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1972-1981, NATURAL GAS/CC
E76	0	NT1	51-4 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1982 TO PRESENT, CRUDE-OIL REFINING/CC
E77	0	NT1	51-5 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1972-1981, MANUFACTURE OF GASOLINE HYDROCARBONS (INCLUDING CATALYSTS USED)/CC
E78	0	NT1	51-5 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1982 TO PRESENT, NATURAL GAS/CC
E79	0	NT1	51-6 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1972-1981, GASOLINE FORMULATIONS/CC
E80	0	NT1	51-6 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1982 TO PRESENT, MANUFACTURE OF GASOLINE HYDROCARBONS (INCLUDING CATALYSTS USED)/CC
E81	0	NT1	51-7 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1972-1981, LUBRICATING OILS/CC
E82	0	NT1	51-7 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1982 TO PRESENT, GASOLINE FORMULATIONS/CC
E83	0	NT1	51-8 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1972 TO PRESENT, LUBRICANTS AND FUNCTIONAL FLUIDS/CC
E84	0	NT1	51-9 FOSSIL FUELS, DERIVATIVES, AND RELATED PRODUCTS, 1972 TO PRESENT, OTHER FRACTIONS/CC
***** END *****			

Step 3: Refine using the CA section code

Either the section number or words from the section title may be searched in the fields, but not all words are searchable in the SX field.

```
=> S L2 AND (51/CC,SX OR (PETROL? OR LUBRICA? OR FOSSIL FUEL?)/CC)
```

```
=> D SCAN
```

To maximize recall, section terms are searched in both the CC and SX fields.

```
L7 2154 ANSWERS HCAPLUS COPYRIGHT 2009 ACS on STN
IC ICM C10M141-12
INCL 508251000; 508253000; 508254000; 508362000; 508563000; 508584000
CC 51-8 (Fossil Fuels, Derivatives, and Related
Products)
TI Antioxidant combination for oxidation and deposit control in lubricants
containing molybdenum and alkylated phenothiazine
ST lubricant antioxidant molybdenum alkylated phenothiazine
IT Lubricating oil additives
(antioxidants; antioxidant combination for oxidn. and deposit control
in lubricants contg. molybdenum and alkylated phenothiazine)
IT Phenols, uses
RL: MOA (Modifier or additive use); USES (Uses)
(calcium salts; antioxidant combination for oxidn. and deposit control
in lubricants contg. molybdenum and alkylated phenothiazine)
IT Lubricating oils
(crankcase; antioxidant combination for oxidn. and deposit control in
lubricants contg. molybdenum and alkylated phenothiazine)
IT Hydraulic fluids
(transmission, automatic; antioxidant combination for oxidn. and
deposit control in lubricants contg. molybdenum and alkylated
phenothiazine)
IT 92-84-2D, Phenothiazine, alkyl derivs. 122-39-4D, Diphenylamine, alkyl
derivs. 7439-98-7, Molybdenum, uses 124071-29-0 850019-82-8
RL: MOA (Modifier or additive use); USES (Uses)
(antioxidant combination for oxidn. and deposit control in lubricants
contg. molybdenum and alkylated phenothiazine)
IT 7723-14-0, Phosphorus, miscellaneous
RL: MSC (Miscellaneous)
(antioxidant combination for oxidn. and deposit control in lubricants
contg. molybdenum and alkylated phenothiazine)
```

```
HOW MANY MORE ANSWERS DO YOU WISH TO SCAN? (1):0
```

Skills Practice

1. Locate references discussing zeolite catalysts used in polymerization.

Refine results using

- a. IPC codes
- b. CA section assignment

2. Locate references on the effect of radiation on the DNA in grains. Refine results as above.

ADVANCED SUBJECT SEARCH TECHNIQUES IN CAPLUSSM

SUGGESTED SOLUTIONS TO SKILLS PRACTICE PROBLEMS

SEPTEMBER 2009

The solutions presented here are solutions that can be attained using techniques and search tools presented in the accompanying workbook.

Skills Practice (page 12)

Question 1: Use the CPlus record below to answer the following questions.

```
AN 1988:222965 CAPLUS Full-text
DN 108:222965
TI Rubber composition for tire treads
IN Halasa, Adel Farhan; Gross, Bill Bud; Cox, Joel Lynn;
   Balogh, George Frank
PA Goodyear Tire and Rubber Co., USA
SO Eur. Pat. Appl., 10 pp. CODEN: EPXXDW
DT Patent
LA English
IC ICM C08L009-00
   ICS B60C001-00
CC 39-13 (Synthetic Elastomers and Natural Rubber)
ST tire tread rubber glass temp; isoprene butadiene rubber
   tread; wear resistance tire tread;
   tetramethylethylenediamine modifier polymn; anionic polymn
   butadiene isoprene
IT Polymerization
   (anionic, two-stage, of dienes, for rubbers with
   multiple glass temp.)
IT Tires
   (treads, abrasion- and wet skid-resistant, rubbers for,
   with multiple glass temps.,)
```

1. *Identify the patent classification codes:*

The patent codes appear in the IC field: ICM C08L009-00 and ICS B60C001-00.

2. *What is the section assignment?*

The section assignment appears in the CC field: 39-13 (Synthetic Elastomers and Natural Rubber).

Is there a section cross-reference?

No, the section cross-reference also would display in the CC field if it were present.

3. *Identify the controlled-vocabulary indexing terms:*

The controlled terminology appears in the IT field: Polymerization and Tires.

Skills Practice (page 45)

Question 1: For what time period was *maple* a valid index term? What is its earliest reference? What is the present valid index term?

Suggested Approach

1. Enter HCAplus and expand on the word maple in the CT field
2. Invoke the thesaurus
3. Search on the term maple in the CT field

Step 1. Enter HCAplus and EXPAND on MAPLE/CT

```
=> FIL HCAPLUS
```

```
=> E MAPLE/CT
```

E#	FREQUENCY	AT	TERM
--	-----	--	----
E1	0	2	MAPEG CO 8/CT
E2	0	1	MAPISAGA/CT
E3	1883	2 -->	MAPLE/CT
E4	1	2	MAPLE (ACER ARGUTUM) /CT
E5	2	2	MAPLE (ACER BUERGERIANUM) /CT
E6	0	2	MAPLE (ACER CAESIUM) /CT
E7	5	2	MAPLE (ACER CAMPESTRE) /CT
E8	1	2	MAPLE (ACER CARPINIFOLIUM) /CT
E9	0	2	MAPLE (ACER CAUDATUM UKURUNDUENSE) /CT
E10	0	2	MAPLE (ACER CAUDATUM) /CT
E11	0	2	MAPLE (ACER CIRCINATUM) /CT
E12	1	2	MAPLE (ACER CISSIFOLIUM) /CT

An AT count of 2 indicates that "maple" is indexed at another heading. EXPAND on E3+ALL to see the current index heading.

Step 2. Invoke the Thesaurus

```
=> E E3+ALL

E13      1883    --> Maple/CT
          HNTÉ Valid heading during volumes 11-125 (1917-1996)
          only.
E14      233     NEW  Acer/CT
*****  END***
```

"Maple" valid as a controlled term from 1917 - 1996. Present controlled term is "Acer".

Step 3. Search MAPLE/CT

```
=> S MAPLE/CT

L2      1883  MAPLE/CT

=> D 1883

L2      ANSWER 1883 OF 1883  HCAPLUS  COPYRIGHT 2009 ACS on STN
AN      1917:1335  HCAPLUS  Full-text
DN      11:1335
OREF    11:263b-g
TI      Storage of sugar in the maple tree
AU      Jones, C. H.
CS      Vermont Agr. Expt. Sta.
SO      Journal of the Association of Official Agricultural Chemists (1916),
        2;Pt.I, 103-12
        CODEN: JOACAZ; ISSN: 0095-9111
DT      Journal
LA      Unavailable
```

The oldest record with "maple" as a controlled term is from 1917.

Skills Practice (page 45)

Question 2: What chemical substances have been linked to detergents?

Suggested Approach

Enter HCAplus and EXPAND on the word detergents in the CT field using the RTCS relationship code.

```
=> E DETERGENTS+RTCS/CT

E1      53206  --> Detergents/CT
E2      RTCS 3-((3-Cholamidopropyl)dimethylammonio)-1-
          propanesulfonate/CT
E3      RTCS Acrylic acid-maleic acid copolymer/CT
E4      RTCS Acrylic acid-maleic acid copolymer sodium salt/CT
E5      RTCS Benzylododecyldimethylammonium chloride/CT
E6      RTCS Butylene oxide/CT
E7      RTCS Didecyldimethylammonium chloride/CT
E8      RTCS Disodium peroxydicarbonate/CT
E9      RTCS Dodecyldimethylamine oxide/CT
E10     RTCS Lauric acid diethanolamide/CT
E11     RTCS Sodium perborate/CT
E12     RTCS Sodium percarbonate/CT
E13     RTCS Tetraacetythylenediamine/CT
E14     RTCS Tetrakis(2-hydroxypropyl)ethylenediamine/CT
*****  END***
```

The same results could have been displayed using E DETERGENTS+ALL/NT. Remember that the RTCS substances are commonly indexed substances that have often been co-indexed with the detergents controlled term.

note

Of the 53,206 references with "detergents" as a controlled term, 3,843 of them also have one or more of the RTCS substances indexed.

Helpful HINT

To see all of the controlled terms linked to a specific RTCS substance, EXPAND on the E-number of the RTCS substance.

```
=> E E13+ALL
```

Skills Practice (page 45)

Question 3: Find references on stable polymorphs related to pharmaceutical dosage forms.

Suggested Approach

1. Do a Basic Index search in HCAplus
2. Analyze the results for controlled terminology
3. Enhance the search results using the controlled terminology in the CA Lexicon
4. Combine results

Step 1. Do a Basic Index Search

```
=> S (STABLE (L) POLYMORPH) AND PHARMACEUTICAL DOSAGE FORM
```

```
763394 STABLE
      420 STABLES
763691 STABLE
      (STABLE OR STABLES)
      9612 POLYMORPH
      11003 POLYMORPHS
      16686 POLYMORPH
      (POLYMORPH OR POLYMORPHS)
      1673 STABLE (L) POLYMORPH
358919 PHARMACEUTICAL
      94233 PHARMACEUTICALS
415260 PHARMACEUTICAL
      (PHARMACEUTICAL OR PHARMACEUTICALS)
158715 DOSAGE
      23593 DOSAGES
175807 DOSAGE
      (DOSAGE OR DOSAGES)
1852488 FORM
      699810 FORMS
2384935 FORM
      (FORM OR FORMS)
      50923 PHARMACEUTICAL DOSAGE FORM
      (PHARMACEUTICAL (W) DOSAGE (W) FORM)
```

The SET PLURALS feature is on.

```
L1          14 (STABLE (L) POLYMORPH) AND PHARMACEUTICAL DOSAGE FORM
```

Step 2. Analyze for Controlled Terms

=> ANA L1 CT 1-

L2 ANALYZE L1 1- CT : 49 TERMS

=> D

L2 ANALYZE L1 1- CT : 49 TERMS

The default display is OCC (occurrence) order. To display in DOC order use D DOC.

TERM #	# OCC	# DOC	% DOC	CT
1	12	11	78.57	PHARMACEUTICAL DOSAGE FORMS
2	6	3	21.43	DRUG DELIVERY SYSTEMS
3	4	4	28.57	POLYMORPHISM
4	2	2	14.29	CRYSTALLIZATION
5	2	2	14.29	GLYCERIDES, BIOLOGICAL STUDIES
6	2	2	14.29	SOLUTION RATE
7	1	1	7.14	ACACIA
8	1	1	7.14	ANTIASTHMATICS
9	1	1	7.14	ANTIPARKINSONIAN AGENTS
10	1	1	7.14	ANTIPSYCHOTICS

39 MORE TERMS WITH AN OCCURRENCE COUNT OF 1

Polymorphism is one of the CT terms. Pharmaceutical dosage forms is the most used term in these answers, but "drug delivery systems" is also a valid term.

Step 3. Enhance the Search Results Using the CA Lexicon

Polymorphism term

=> E POLYMORPHISM+ALL/CT

E1 2289 --> Polymorphism/CT
HNTE Valid heading during volumes 1-125 (1907-1996)
only.

E2 2787 NEW Crystal polymorphism/CT
***** END***

"Polymorphism" was valid from 1907 - 1996, but has been succeeded by "crystal polymorphism".

=> E E2+ALL

E3 4455 BT2 Physical and chemical properties/CT

E4 467538 BT1 Crystal structure/CT

E5 2787 --> Crystal polymorphism/CT

HNTE Valid heading during volume 146 (2007) to present.

E6 2289 OLD Polymorphism/CT

E7 5260 OLD Polymorphism (crystal)/CT

E8 UF Polymorphic transition/CT

E9 UF Polystructure/CT

(continued on next page)

```

E10      1956      NT1  Polytypism/CT
E11      13609     RT   Crystal morphology/CT
E12      465      RT   Crystal polymorphs/CT
E13      967      RT   Isomorphism/CT
E14      47450    RT   Phase transition/CT
E15      32744    RT   Structural phase transition/CT
***** END *****

```

```
=> S E4+PFT,NT
```

```
L3      12269 "CRYSTAL POLYMORPHISM"+PFT,NT/CT
```

```
=> S L3 (L) (STABLE OR STABILI?)
```

```

763394 STABLE
420 STABLES
763691 STABLE
(STABLE OR STABLES)
1270990 STABILI?
L4      389 L7(L) (STABLE OR STABILI?)

```

Dosage form

Although the SET EXPAND CONTINUOUS feature is on, it is good practice to clear the E-numbers before beginning a new term.

```
=> DEL EXP Y
```

```
=> E PHARMACEUTICAL DOSAGE FORMS/CT
```

```

E#  FREQUENCY  AT  TERM
--  -
E1      2      PHARMACEUTICAL DOSAGE FOMRS/CT
E2      0      PHARMACEUTICAL DOSAGE FORM/CT
E3      48099  2  --> PHARMACEUTICAL DOSAGE FORMS/CT
E4      0      PHARMACEUTICAL DOSAGE FORMS (L) AEROSOLS/CT
E5      0      PHARMACEUTICAL DOSAGE FORMS (L) AEROSOLS, INHALANTS/CT
E6      0      PHARMACEUTICAL DOSAGE FORMS (L) AEROSOLS, LIPOSOMES/CT
E7      0      PHARMACEUTICAL DOSAGE FORMS (L) AEROSOLS, POWDERS/CT
E8      0      PHARMACEUTICAL DOSAGE FORMS (L) AQ./CT
E9      0      PHARMACEUTICAL DOSAGE FORMS (L) BEADS/CT
E10     0      PHARMACEUTICAL DOSAGE FORMS (L) BEADS, CONTROLLED-RELE
ASE/CT
E11     0      PHARMACEUTICAL DOSAGE FORMS (L) BEADS, SUSTAINED-RELEA
SE/CT
E12     0      PHARMACEUTICAL DOSAGE FORMS (L) BIOADHESIVE/CT

```

=> E E3+ALL

E13 48099 --> Pharmaceutical dosage forms/CT
HNTD Valid heading during volumes 106-125 (1987-1996) only.
E14 186400 NEW Drug delivery systems/CT
***** END***

=> E E14+ALL

E15 2813 BT1 Health products/CT
E16 186400 --> Drug delivery systems/CT
HNTD Valid heading during volume 126 (1997) to present.
E17 OLD Drug delivery systems (L) disks/CT
E18 OLD Drug delivery systems (L) sachets/CT
E19 48099 OLD Pharmaceutical dosage forms/CT
E20 OLD Pharmaceutical dosage forms (L) disks/CT
E21 OLD Pharmaceutical dosage forms (L) sachets/CT
E22 OLD Pharmaceuticals (L) disks/CT
E23 UF Delivery systems/CT
E24 UF Dosage forms/CT
E25 UF Drug delivery system/CT
E26 UF Pharmaceutical delivery systems/CT
E27 UF Pharmaceutical dosage form/CT
E28 UF Pharmaceutical formulations/CT
E29 10017 NT1 Controlled-release drug delivery systems/CT

•
•
•

E40 1190 NT2 Buccal drug delivery systems/CT
E41 3348 NT2 Inhalation drug delivery systems/CT
E42 2736 NT2 Nasal drug delivery systems/CT
E43 2415 NT2 Ophthalmic drug delivery systems/CT
E44 95 NT3 Ophthalmic drug inserts/CT
E45 203 NT2 Pharmaceutical chewing gum/CT
E46 593 NT2 Pharmaceutical lozenges/CT
E47 991 NT2 Rectal drug delivery systems/CT
E48 125 NT3 Enemas/CT
E49 692 NT2 Sublingual drug delivery systems/CT
E50 1005 NT2 Vaginal drug delivery systems/CT
E51 15134 NT1 Oral drug delivery systems/CT
E52 1190 NT2 Buccal drug delivery systems/CT
E53 523 NT2 Chewable drug delivery systems/CT
E54 203 NT3 Pharmaceutical chewing gum/CT
E55 593 NT2 Pharmaceutical lozenges/CT

•
•
•

E100 594 NT1 Pharmaceutical particles/CT
E101 421 NT2 Pharmaceutical beads/CT
E102 6726 NT2 Pharmaceutical granules/CT
E103 5392 NT2 Pharmaceutical liposomes/CT
E104 1570 NT2 Pharmaceutical microparticles/CT
E105 1189 NT3 Pharmaceutical microcapsules/CT
E106 2377 NT3 Pharmaceutical microspheres/CT
E107 5938 NT2 Pharmaceutical nanoparticles/CT
E108 413 NT3 Pharmaceutical nanocapsules/CT
E109 338 NT3 Pharmaceutical nanospheres/CT
E110 5658 NT2 Pharmaceutical powders/CT

(continued on next page)

```

E111      154      NT1  Pharmaceutical semisolids/CT
E112      203      NT2  Pharmaceutical chewing gum/CT
E113      2136     NT2  Pharmaceutical creams/CT
E114      469      NT2  Pharmaceutical foams/CT
E115      4540     NT2  Pharmaceutical gels/CT
●
●
●
E131      1153     NT2  Pharmaceutical pellets/CT
E132      5658     NT2  Pharmaceutical powders/CT
E133      1451     NT2  Pharmaceutical suppositories/CT
E134      19580    NT2  Pharmaceutical tablets/CT
E135      3429     NT1  Prodrugs/CT
E136      7264     NT1  Topical drug delivery systems/CT
E137      2736     NT2  Nasal drug delivery systems/CT
E138      2415     NT2  Ophthalmic drug delivery systems/CT
E139      95       NT3  Ophthalmic drug inserts/CT
E140      138     NT2  Otic drug delivery systems/CT
E141      991     NT2  Rectal drug delivery systems/CT
E142      125     NT3  Enemas/CT
E143      3801     NT2  Transdermal drug delivery systems/CT
E144      632     NT3  Pharmaceutical patches/CT
E145      1005     NT2  Vaginal drug delivery systems/CT
E146      3801     NT1  Transdermal drug delivery systems/CT
E147      632     NT2  Pharmaceutical patches/CT
E148      27832    RT   Drug bioavailability/CT
E149      18376    RT   Drug design/CT
E150      7851     RT   Drug metabolism/CT
E151      34032    RT   Drugs/CT
E152      159      RT   Sachets/CT
***** END *****

```

=> S E16+PFT,NT

L5 325519 "DRUG DELIVERY SYSTEMS"+PFT,NT/CT (83 TERMS)

Step 4. Combine Results

=> S L4 AND L5

L6 68 L4 AND L5

=> S L6 NOT L1

L7 67 L6 NOT L1

All but one of the CA Lexicon answers is unique (L7).

=> D HIT 1 5

L7 ANSWER 1 OF 67 HCAPLUS COPYRIGHT 2009 ACS on STN

IT Complex modulus

Crystal polymorphism

Crystallization temperature

Gelation

Loss modulus

Melting point

Nanofluids

Particle shape

Pharmaceutical suspensions

Stability

Storage modulus

Structural phase transition

(omega-3 fatty acids effect on crystallization, polymorphic transformation and **stability** of tripalmitin solid lipid nanoparticle suspensions)

IT **Pharmaceutical nanoparticles**

(solid lipid; omega-3 fatty acids effect on crystallization, Polymorphic transformation and stability of tripalmitin solid lipid nanoparticle suspensions)

L7 ANSWER 5 OF 67 HCAPLUS COPYRIGHT 2009 ACS on STN

IT **Pharmaceutical tablets**

(coated tablets; medical-use stable crystal form of aripiprazole, preparation method and medical composition thereof)

IT Antipsychotics

Crystal polymorphism

Crystallization

Dissolution

Hygroscopicity

(medical-use **stable** crystal form of aripiprazole, preparation method and medical composition thereof)

=> S L6 OR L1

L8 81 L6 OR L1

The CA Lexicon added 67 new answers to the original 14 from the Basic Index search.

Skills Practice (page 69)

Question 1: Locate references discussing zeolite catalysts used in polymerization.

Suggested Approach

1. Do a Basic Index search in HCAplus
2. Analyze the results for controlled terminology
3. Enhance the search results using the controlled terminology in the CA Lexicon
4. Analyze for IPC code and CA section assignment
5. Refine using the most frequently occurring IPC code
6. Refine using the most common section assignment

Step 1. Do a Basic Index Search

```
=> FIL HCAPLUS; S ZEOLITE (L) ?CATALY? (L) ?POLYMERIZ?
```

```
114818 ZEOLITE
110557 ZEOLITES
139828 ZEOLITE
      (ZEOLITE OR ZEOLITES)
1590990 ?CATALY?
453945 ?POLYMERIZ?
120976 ?POLYMD
120976 ?POLYMD
  97258 POLYMD
  97258 POLYMD
  46925 ?POLYMG
  37979 POLYMG
  37979 POLYMG
443292 ?POLYMN
390576 POLYMN
  10573 POLYMNS
391990 POLYMN
      (POLYMN OR POLYMNS)
676708 ?POLYMERIZ?
      (?POLYMERIZ? OR ?POLYMD OR POLYMD OR ?POLYMG OR POLYMG
      OR ?POLYMN OR POLYMN)
L1      1258 ZEOLITE (L) ?CATALY? (L) ?POLYMERIZ?
```

Command stacking: separate the commands with a semicolon ";".

Step 2. Analyze for Controlled Terms

=> ANA L1 1- CT

L2 ANALYZE L1 1- CT : 1253 TERMS

=> D

L2 ANALYZE L1 1- CT : 1253 TERMS

TERM #	# OCC	# DOC	% DOC	CT
1	870	824	65.50	POLYMERIZATION CATALYSTS
2	436	341	27.11	ZEOLITES, USES AND MISCELLANEOUS
3	295	278	22.10	POLYMERIZATION
4	231	126	10.02	ZEOLITES, USES
5	152	138	10.97	ZEOLITES (SYNTHETIC), USES
6	150	93	7.39	PETROLEUM REFINING CATALYSTS
7	123	102	8.11	ALUMINOXANES
8	114	110	8.74	ZEOLITE MCM-41
9	99	94	7.47	ALKENES, REACTIONS
10	91	88	7.00	ZEOLITES

Step 3. Enhance Results using the CA Lexicon

Polymerization catalysts

=> E POLYMERIZATION CATALYSTS/CT

E#	FREQUENCY	AT	TERM
E1	0	5	POLYMERIZATION APPARATUS (L) SUSPENSION/CT
E2	0	7	POLYMERIZATION APPARATUS (L) TUBULAR/CT
E3	120466	62	--> POLYMERIZATION CATALYSTS/CT
E4	0	4	POLYMERIZATION CATALYSTS (L) ALTERNATING/CT
E5	0	7	POLYMERIZATION CATALYSTS (L) ANIONIC/CT

●
●
●

=> E E3+ALL

E13	99729	BT1	Catalysts/CT
E14	120466	-->	Polymerization catalysts/CT HNTE Valid heading during volume 66 (1967) to present.
E15		OLD	Polymerization (L) catalysts/CT
E16		UF	Addn. polymn. catalysts/CT
E17		UF	Condensation polymn. catalysts/CT

(continued on next page)

```

E18          UF   Polymerisation initiators/CT
E19          UF   Polymerization initiators/CT
E20          UF   Random polymerization catalysts/CT
E21      20347  NT1  Crosslinking catalysts/CT
E22          729  NT2  Driers (for coatings)/CT
E23      4563   NT1  Dimerization catalysts/CT
E24          69   NT2  Cyclodimerization catalysts/CT
E25      4874   NT1  Polymerization inhibitors/CT
E26          641   NT1  Telomerization catalysts/CT
E27      1620   NT1  Trimerization catalysts/CT
E28          407   NT2  Cyclotrimerization catalysts/CT
E29      225215 RT   Polymerization/CT
E30          RTCS 1,4-Diphenyl-1,3-butadiene/CT
E31          RTCS 1-Phenylethyl chloride/CT
E32          RTCS 2,2'-Azobis(2,4-dimethylvaleronitrile)/CT
●
●
●
E45          RTCS Dichloro(1,5-cyclooctadiene)palladium/CT
E46          RTCS Diethyl (3,5-di-tert-butyl-4-
              (hydroxybenzyl)phosphonate/CT
E47          RTCS Diethylaluminum chloride/CT
E48          RTCS Dimethylaluminum chloride/CT
E49          RTCS Dimethylzirconocene/CT
E50          RTCS Ethyl 2-bromoisobutyrate/CT
E51          RTCS Ethyl 4-(dimethylamino)benzoate/CT
E52          RTCS Ethyl 4-methoxybenzoate/CT
E53          RTCS Ethylaluminum dichloride/CT
E54          RTCS Ethylaluminum sesquichloride/CT
E55          RTCS Ethylene glycol monoacetate/CT
E56          RTCS Irganox 1425/CT
E57          RTCS Lithium tert-butoxide/CT
E58          RTCS N,N-Dimethyl-p-toluidine/CT
E59          RTCS N,N-Dimethylanilinium
              tetrakis(pentafluorophenyl)borate/CT
E60          RTCS N-Phenylglycine/CT
E61          RTCS Pentamethyldiethylenetriamine/CT
E62          RTCS Phosphine oxide/CT
E63          RTCS Potassium tert-butoxide/CT
E64          RTCS Rac-ethylenebis(indenyl)zirconium dichloride/CT
E65          RTCS Rhodium norbornadiene chloride dimer/CT
E66          RTCS Tert-Butyl peroxy-2-ethylhexanoate/CT
E67          RTCS Tert-Butyl peroxy-pivalate/CT
E68          RTCS Titanium tetrabromide/CT
E69          RTCS Tributylaluminum/CT
E70          RTCS Triethylaluminum/CT
E71          RTCS Trihexylaluminum/CT
E72          RTCS Triisobutylaluminum/CT
E73          RTCS Tris(pentafluorophenyl)borane/CT
E74          RTCS Zirconocene dichloride/CT
***** END *****
=> S E14+NT

L3      150428 "POLYMERIZATION CATALYSTS"+NT/CT (9 TERMS)

```

Zeolites

=> DEL EXP Y

=> E ZEOLITES/CT

E#	FREQUENCY	AT	TERM
--	-----	--	----
E1	0	1	ZEOLITE-GROUP/CT
E2	4079	24	ZEOLITE-GROUP MINERALS/CT
E3	50163	2 -->	ZEOLITES/CT
E4	0	2	ZEOLITES (L) 10X/CT
E5	0	2	ZEOLITES (L) 13X/CT

●
●
●

=> E E3+ALL

E13	50163	-->	Zeolites/CT	HNTE Valid heading during volumes 66-125 (1967-1996) only.
E14	27540	NEW	Zeolites (synthetic)/CT	***** END***

=> E E14+ALL

E15	4455	BT3	Physical and chemical properties/CT	
E16	467538	BT2	Crystal structure/CT	
E17	14635	BT1	Crystal structure types/CT	
E18	23674	BT1	Materials/CT	
E19	392	BT3	Main group element compounds/CT	
E20	2755	BT2	Group VIA element compounds/CT	
E21	47056	BT1	Oxides (inorganic)/CT	
E22	27540	-->	Zeolites (synthetic)/CT	HNTE Valid heading during volume 126 (1997) to present.
E23	50163	OLD	Zeolites/CT	
E24		UF	AFR/CT	
E25		UF	AFS/CT	
E26		UF	AFY/CT	
E27		UF	AMT 25E/CT	
E28		UF	ASHNCH 3/CT	
E29		UF	Abscents 1000/CT	
E30		UF	Abscents 200/CT	

●
●
●

E200		UF	Silton JC 20/CT
E201		UF	Silton JC 3C/CT
E202		UF	Silton LP 75/CT
E203		UF	Smellrite/CT
E204		UF	Sodium zeolites/CT
E205		UF	Spansorb C/CT
E206		UF	Sun-Zeolite 3S/CT

(continued on next page)

```

E207          UF  Sylosiv/CT
E208          UF  Sylosiv 100/CT
E209          UF  Sylosiv A 100/CT
E210          UF  Sylosiv A 300/CT
E211          UF  Synthetic zeolites/CT
E212          UF  T 134/CT
E213          UF  T 134 (zeolite)/CT
E214          UF  TEP BP-AB 3/CT
E215          UF  TSZ 300/CT
E216          UF  TSZ 700/CT
E217          UF  Tama Lite/CT
E218          UF  Tixolex 17S/CT
E219          UF  Tomix 550/CT
E220          UF  Toyoesta/CT
●
●
●
E331          246          NT2  Zeolite KL/CT
E332          1388         NT1  MCM zeolites/CT
E333          893          NT2  Zeolite MCM-22/CT
E334          5610         NT2  Zeolite MCM-41/CT
E335          2724         NT1  Mordenite-type zeolites/CT
E336          960          NT2  Hydrogen mordenite-type zeolites/CT
E337          323          NT1  Sodalite-type zeolites/CT
E338          1384         NT1  Titanosilicate zeolites/CT
E339          127          NT1  Zeolite omega/CT
E340          18947        RT   Absorbents/CT
E341          34779        RT   Adsorbents/CT
E342          12543        RT   Molecular sieves/CT
E343          36104        RT   Porous materials/CT
E344          4079         RT   Zeolite-group minerals/CT
***** END *****

=> S E22+PFT,NT

L4          115078 "ZEOLITES (SYNTHETIC)" +PFT,NT/CT (318 TERMS)

=> S L3 AND L4

L5          1529 L3 AND L4

=> D SCAN HIT

L5          1529 ANSWERS HCAPLUS COPYRIGHT 2009 ACS on STN
IT          Molding of plastics and rubbers
            Plastic films
            Polymerization catalyysts
            (copolymer comprising alkene, acrylate and unsatd. Acid
            anhydride, and method for preparing the same)
IT          Zeolites (synthetic)
            RL: CAT (Catalyst use); USES (Uses)
            (lewis acid; copolymer comprising alkene, acrylate and unsatd.
            Acid anhydride, and method for preparing the same)
IT          Polymerization catalyysts
            (radical; copolymer comprising alkene, acrylate and unsatd. acid
            anhydride, and method for preparing the same)

HOW MANY MORE ANSWERS DO YOU WISH TO SCAN? (1):END

```

Step 4. Analyze for IPC and CC

=> ANA L5 IC CC

L6 ANALYZE L5 1- IC CC : 846 TERMS

=> D CC

L6 ANALYZE L5 1- IC CC : 846 TERMS

TERM #	# OCC	# DOC	% DOC	IC CC
1	375	375	24.53	35-3
2	143	143	9.35	45-4
3	100	100	6.54	35-4
4	70	70	4.58	23-2
5	64	64	4.19	35-2
6	52	52	3.40	67-1
7	49	49	3.20	51-6
9	44	44	2.88	37-3
10	41	41	2.68	38-3
12	31	31	2.03	22-4
13	31	31	2.03	35-5

Analyze for both fields at once and save an additional fee. Remember, you analyze multiple fields up to 50,000 terms for the same fee.

Display the analyze results separately for each field.

=> D IC

L6 ANALYZE L5 1- IC CC : 846 TERMS

TERM #	# OCC	# DOC	% DOC	IC CC
8	47	47	3.07	C07C002-12
11	34	34	2.22	C08F010-00
18	21	21	1.37	B01J029-04
23	18	18	1.18	C08F004-02
24	18	18	1.18	C08F004-642
25	16	16	1.05	C07C002-02
29	14	14	0.92	C07C011-02
31	13	13	0.85	B01J029-06
32	12	12	0.78	C01B033-28
33	12	12	0.78	C08K003-34

=> DEL EXP Y

=> E 35+ALL/CC

E1 342304 --> 35/CC
 E2 416 USE 35 ALKALOIDS, 1962 ONLY/CC
 E3 224674 USE 35 CHEMISTRY OF SYNTHETIC HIGH POLYMERS, 1982 TO PRESENT/CC
 E4 14808 USE 35 NONCONDENSED AROMATIC COMPOUNDS, 1963-1966/CC
 E5 102406 USE 35 SYNTHETIC HIGH POLYMERS, 1967-1981/CC
 ***** END***

=> E C07C002-12+INDEX/IC

E6 157 --> C07C002-12/IC
 with crystalline alumino-silicates, e.g.
 molecular sieves (3)
 ***** END***

=> S L1 OR L5

L7 1997 L1 OR L5

Combine the CA Lexicon and Basic Index results prior to refinement.

Step 5. Refine with IPC Code

=> S L7 AND C07C002-12/IC

L8 157 C07C002-12/IC
L8 52 L7 AND C07C002-12/IC

=> D HIT 1 18 39

L8 ANSWER 1 OF 52 HCAPLUS COPYRIGHT 2009 ACS on STN
IC ICS C07C002-12
IT **MCM zeolites**
RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation);
USES (Uses)
(MCM-56; MCM-56 mol. sieve catalyst for butylene oligomerization)
IT **Polymerization catalysts**
(oligomerization; MCM-56 mol. sieve catalyst for butylene oligomerization)

L8 ANSWER 26 OF 52 HCAPLUS COPYRIGHT 2009 ACS on STN
IC ICS C07C002-10; C07C002-12; C07C002-14; C07C002-16; C07C002-18; C07C002-20; C08F002-00
IT Bentonite, uses
Beta zeolites
Faujasite-type zeolites
Fuller's earth
Mordenite-type zeolites
Y zeolites
Zeolite NaX
Zeolite NaY
Zeolite ZSM-11
Zeolite ZSM-5
RL: CAT (Catalyst use); USES (Uses)
(acidic; solid acids as catalysts for the preparation of hydrocarbon resins)
IT **Polymerization catalysts**
(solid acids as catalysts for the preparation of hydrocarbon resins)

●
●
●

Step 6. Refine with CA Section Assignment

=> S L7 AND 35/CC,SX

342304 35/CC

89178 35/SX

L9 925 L7 AND 35/CC,SX

=> D 100 450 HIT

L9 ANSWER 100 OF 925 HCAPLUS COPYRIGHT 2009 ACS on STN

CC 35-3 (Chemistry of Synthetic High Polymers)

Section cross-reference(s): 67

IT **Polymerization catalysts**

(Ziegler-Natta; catalyst particles containing inclusions, their preparation, and use in polymerization of olefins)

IT **Polymerization catalysts**

(catalyst particles containing inclusions, their preparation, and use in polymerization of olefins)

IT **Zeolites (synthetic), uses**

RL: NUU (Other use, unclassified); USES (Uses)

(**catalyst** particles containing inclusions, their preparation, and use in polymerization of olefins)

L9 ANSWER 450 OF 925 HCAPLUS COPYRIGHT 2009 ACS on STN

CC 35-3 (Chemistry of Synthetic High Polymers)

IT **Polymerization catalysts**

(metallocene; pore diameter distribution in adsorptive separation of methylalumoxane over MCM-41 **zeolites**)

IT **Silicalites (zeolites)**

Zeolite MCM-41

RL: NUU (Other use, unclassified); PRP (Properties); USES (Uses)

(shape-selective adsorbent; pore diameter distribution in adsorptive separation of methylalumoxane over MCM-41 zeolites)

IT 74-85-1, Ethylene, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(**polymerization** of, over metallocene **catalysts**; pore diameter distribution in adsorptive separation of methylalumoxane over MCM-41 **zeolites**)

Skills Practice (page 69)

Question 2: Locate references on the effect of radiation on the DNA in grains. Refine results as above.

Suggested Approach:

1. Do a Basic Index search in HCAplus
2. Analyze the results for controlled terminology
3. Enhance the search results using the controlled terminology in the CA Lexicon
4. Analyze for IPC code and CA section assignment
5. Refine using the most frequently occurring IPC code
6. Refine using the most common section assignment

Step 1. Do a Basic Index Search

```
=> S RADIATION (L) (DNA OR DEOXYRIBONUCLEIC ACID) (L) GRAIN

      826429 RADIATION
      14138 RADIATIONS
      832254 RADIATION
              (RADIATION OR RADIATIONS)
      976920 DNA
      21099 DNAS
      980264 DNA
              (DNA OR DNAS)
      265000 DEOXYRIBONUCLEIC
      4898251 ACID
      1711523 ACIDS
      5431225 ACID
              (ACID OR ACIDS)
      264778 DEOXYRIBONUCLEIC ACID
              (DEOXYRIBONUCLEIC (W) ACID)
      976920 DNA
      21099 DNAS
      980264 DNA
              (DNA OR DNAS)
      1043865 DEOXYRIBONUCLEIC ACID
              (DEOXYRIBONUCLEIC ACID OR DNA)
      366580 GRAIN
      171001 GRAINS
      467164 GRAIN
              (GRAIN OR GRAINS)
L1          36 RADIATION (L) (DNA OR DEOXYRIBONUCLEIC ACID) (L) GRAIN
```

Step 2. Analyze for Controlled Terms

=> ANA CT 1-

L2 ANALYZE L1 1- CT : 150 TERMS

=> D

L2 ANALYZE L1 1- CT : 150 TERMS

TERM #	# OCC	# DOC	% DOC	CT
1	10	10	27.78	DEOXYRIBONUCLEIC ACIDS
2	6	6	16.67	GAMMA RAY
3	5	4	11.11	X-RAYS
4	4	4	11.11	DEOXYRIBONUCLEIC ACID FORMATION
5	4	4	11.11	DNA DAMAGE
6	4	3	8.33	DEOXYRIBONUCLEIC ACID REPAIR
7	4	3	8.33	LIVER
8	4	3	8.33	ULTRAVIOLET RADIATION
9	3	3	8.33	BARLEY
10	3	3	8.33	CELL NUCLEUS
11	3	3	8.33	MUTATION
12	3	3	8.33	ORYZA SATIVA
13	3	3	8.33	RADIATION
14	3	3	8.33	TRITICUM AESTIVUM
15	3	3	8.33	UV B RADIATION
16	3	1	2.78	LIFE

=> D 17-25

L2 ANALYZE L1 1- CT : 100 TERMS

Display further terms from analyze result.

TERM #	# OCC	# DOC	% DOC	CT
17	2	2	5.56	CELLS, PLANT
18	2	2	5.56	CHROMOSOME
19	2	2	5.56	CHROMOSOMES
20	2	2	5.56	DNA
21	2	2	5.56	GENETIC POLYMORPHISM
22	2	2	5.56	GROWTH AND DEVELOPMENT, PLANT
23	2	2	5.56	INTERPLANETARY SPACE
24	2	2	5.56	INTESTINES
25	2	2	5.56	NUCLEIC ACIDS, DEOXYRIBO-

Step 3. Enhance Results using the CA Lexicon

Deoxyribonucleic acids

=> E DEOXYRIBONUCLEIC ACIDS/CT

E#	FREQUENCY	AT	TERM
--	-----	--	----
E1	0	2	DEOXYRIBONUCLEIC ACID SEQUENCES (L) SATELLITE/CT
E2	0	2	DEOXYRIBONUCLEIC ACID-JOINING ENZYME/CT
E3	137911	2	--> DEOXYRIBONUCLEIC ACIDS/CT
E4	0	2	DEOXYRIBONUCLEIC ACIDS (L) A/CT
E5	0	2	DEOXYRIBONUCLEIC ACIDS (L) ABASIC SITE-CONTG./CT

●
●
●

=> E E3+ALL

E13	137911	-->	Deoxyribonucleic acids/CT HNTE Valid heading during volumes 56-125 (1962-1996) only.
E14	146714		NEW DNA/CT
***** END *****			

=> E E14+ALL

E15	69867	BT2	Acids/CT
E16	13133	BT3	Chemical compounds/CT
E17	51856	BT2	Organic compounds/CT
E18	63155	BT1	Nucleic acids/CT
E19	146714	-->	DNA/CT HNTE Valid heading during volume 51 (1957) to present.
E20	137911	OLD	Deoxyribonucleic acids/CT
E21	10061	OLD	Nucleic acids, deoxyribo-/CT
E22		UF	DNAs/CT
E23		UF	Deoxyribonucleic acid/CT
E24	3975	NT1	Antisense DNA/CT
E25	2039	NT1	Chloroplast DNA/CT
E26	21359	NT1	Microsatellite DNA/CT
E27	15773	NT1	Mitochondrial DNA/CT
E28	185	NT2	Kinetoplast DNA/CT
E29	17014	NT1	Plasmids/CT
E30	134	NT1	Provirus/CT
E31	15706	NT1	Repetitive DNA/CT
E32	1588	NT1	Satellite DNA/CT
E33	5907	NT1	Viral DNA/CT

(continued on next page)

```

E34      10089      NT1  cDNA/CT
E35      4611      RT  Alkylating agents, biological/CT
E36     110889      RT  Chromosome/CT
E37      435      RT  Comet assay/CT
E38     21064      RT  DNA damage/CT
E39     10856      RT  DNA formation/CT
E40      4602      RT  DNA formation factors/CT
E41      2894      RT  DNA fragmentation/CT
E42     8361      RT  DNA replication/CT
E43    130223      RT  DNA sequences/CT
E44      1711      RT  Deoxyribonucleoproteins/CT
E45       576      RT  Deoxyribonucleosides/CT
E46       899      RT  Deoxyribonucleotides/CT
E47      RT  Evolution (L) mol./CT
E48     24175      RT  Genetic methods/CT
E49     2623      RT  Information, biological/CT
E50     47609      RT  Nucleic acid hybridization/CT
E51     49296      RT  Primers (nucleic acid)/CT
E52     34967      RT  Probes (nucleic acid)/CT
E53      RTCS 3H-Thymidine/CT
***** END *****

```

=> S E19+PFT,NT

L3 370283 DNA+PFT,NT/CT (16 TERMS)

Radiation

=> DEL EXP Y

=> E RADIATION/CT

E#	FREQUENCY	AT	TERM
--	-----	--	----
E1	0	1	RADIATA/CT
E2	0	1	RADIATAE/CT
E3	48131	95	--> RADIATION/CT

(continued on next page)

E4	0	3	RADIATION (L) BACKGROUND/CT
E5	0	4	RADIATION (L) BELTS/CT
E6	0	4	RADIATION (L) BELTS, VAN ALLEN/CT
E7	0	2	RADIATION (L) BREMSSTRAHLUNG/CT
E8	0	4	RADIATION (L) DAMAGE/CT
E9	0	2	RADIATION (L) DECELERATION (BREMSSTRAHLUNG)/CT
E10	0	2	RADIATION (L) DETECTORS/CT
E11	0	4	RADIATION (L) EXPOSURE/CT
E12	0	2	RADIATION (L) IONIZING/CT

=> E E3+ALL

E13	48131	-->	Radiation/CT HNTE Valid heading during volume 1 (1907) to present.
E14	105	OLD	Irradiation/CT
E15	200	OLD	Mitogenetic radiation/CT
E16	6155	OLD	Radiation and Radiation effects/CT
E17	1733	OLD	Rays/CT
E18		UF	Dispersion/CT
E19		UF	Dispersion radiation/CT
E20		UF	Radiance/CT
E21		UF	Rays (radiation)/CT
E22	12181	NT1	Electromagnetic wave/CT
E23	1210	NT2	Airglow/CT
E24	696	NT2	Blackbody radiation/CT
E25	6937	NT2	Bremsstrahlung/CT
E26	864	NT2	Channeling radiation/CT
E27	2012	NT2	Cherenkov radiation/CT
E28	809	NT2	Cyclotron radiation/CT
E29	1268	NT2	Evanescent wave/CT
E30	104415	NT2	Gamma ray/CT
E31	6337	NT3	Cosmic gamma ray/CT
E32	5649	NT4	Gamma ray bursts/CT
E33	8751	NT2	IR radiation/CT
E34	3930	NT3	IR laser radiation/CT
E35	132311	NT2	Laser radiation/CT
E36	331	NT3	Coherent x-rays/CT
E37	3930	NT3	IR laser radiation/CT
E38	1285	NT3	Polarized laser radiation/CT
E39	1589	NT3	UV laser radiation/CT
E40	95415	NT2	Light/CT
E41	4239	NT3	Polarized light/CT
E42	31935	NT2	Microwave/CT
E43	5222	NT3	Cosmic microwave background/CT
E44	6054	NT2	Radio wave/CT
E45	13256	NT2	Synchrotron radiation/CT
E46	2094	NT3	X-ray synchrotron radiation/CT
E47	766	NT2	Transition radiation/CT
E48	28732	NT2	UV radiation/CT
E49	1604	NT3	Solar UV radiation/CT
E50	3191	NT3	UV A radiation/CT
E51	5181	NT3	UV B radiation/CT
E52	982	NT3	UV C radiation/CT
E53	1589	NT3	UV laser radiation/CT
E54	835	NT3	Vacuum UV radiation/CT
E55	39442	NT2	X-ray/CT

(continued on next page)

E56	331	NT3	Coherent x-rays/CT
E57	13199	NT3	Cosmic x-ray/CT
E58	831	NT3	Soft x-ray/CT
E59	2387	NT3	X-ray emission/CT
E60	2094	NT3	X-ray synchrotron radiation/CT
E61	587	NT1	Hawking radiation/CT
E62	6092	NT1	Ionizing radiation/CT
E63	20347	NT2	Cosmic ray/CT
E64	6337	NT3	Cosmic gamma ray/CT
E65	5649	NT4	Gamma ray bursts/CT
E66	13199	NT3	Cosmic x-ray/CT
E67	2719	NT3	Extensive air showers (cosmic ray)/CT
E68	1291	NT3	Galactic cosmic ray/CT
E69	736	NT3	Primary cosmic ray/CT
E70	104415	NT2	Gamma ray/CT
E71	6337	NT3	Cosmic gamma ray/CT
E72	5649	NT4	Gamma ray bursts/CT
E73	39442	NT2	X-ray/CT
E74	331	NT3	Coherent x-rays/CT
E75	13199	NT3	Cosmic x-ray/CT
E76	831	NT3	Soft x-ray/CT
E77	2387	NT3	X-ray emission/CT
E78	2094	NT3	X-ray synchrotron radiation/CT
E79	123	NT1	Nuclear radiation/CT
E80	0	NT2	Alpha particle/CT
E81	4239	NT2	Annihilation radiation/CT
E82	0	NT2	Beta particle/CT
E83	104415	NT2	Gamma ray/CT
E84	6337	NT3	Cosmic gamma ray/CT
E85	5649	NT4	Gamma ray bursts/CT
E86	4	NT2	Neutron/CT
E87	1	NT2	Proton/CT
E88	6597	NT1	Solar radiation/CT
E89	1604	NT2	Solar UV radiation/CT
E90	11800	RT	Dosimeters/CT
E91	57917	RT	Heat/CT
E92	885	RT	Radiation chemistry/CT
E93	24413	RT	Radiation detectors/CT
E94	551	RT	Radiation hardening/CT
E95	3115	RT	Radiation shielding/CT
E96	1905	RT	Radiation sickness/CT
E97	2619	RT	Radiation sources/CT
E98	893	RT	Radiative energy transfer/CT
E99	11310	RT	Radioactive substances/CT
E100	9658	RT	Radioactivity/CT
E101	788	RT	Radiology/CT
E102	148	RT	Radiomimetics/CT
E103	2712	RT	Radiopharmaceuticals/CT
E104	5499	RT	Radioprotectants/CT
E105	28881	RT	Radiotherapy/CT
E106	1530	RT	Radiotoxicity/CT
E107	8937	RT	Wave/CT
***** END *****			

```
=> S E13+PFT,NT
```

```
L4      849742 RADIATION+PFT,NT/CT  (57 TERMS)
```

Combine the results

```
=> S L3 AND L4
```

```
L5      11420 L3 AND L4
```

Barley

```
=> E BARLEY/CT
```

E#	FREQUENCY	AT	TERM
--	-----	--	----
E1	1		BARLETT/CT
E2	1		BARLETT, HELEN BLAIR/CT
E3	33135	14 -->	BARLEY/CT
E4	1	2	BARLEY (HORDEUM AGRIOCRITHON)/CT
E5	0	2	BARLEY (HORDEUM ARIZONICUM)/CT
E6	8	2	BARLEY (HORDEUM BOGDANI)/CT
E7	0	2	BARLEY (HORDEUM BRACHYANTHERUM BRACHYANTHERUM)/CT
E8	2	2	BARLEY (HORDEUM BRACHYANTHERUM CALIFORNICUM)/CT
E9	2	2	BARLEY (HORDEUM BRACHYANTHERUM)/CT
E10	7	2	BARLEY (HORDEUM BREVISUBULATUM)/CT
E11	16	2	BARLEY (HORDEUM BULBOSUM)/CT
E12	1	2	BARLEY (HORDEUM CALIFORNICUM)/CT

```
=> E E3+ALL
```

E13	80085		BT3 Food/CT
E14	0		BT2 Plant-derived food (non-CA heading)/CT
E15	633	BT8	Organisms/CT
E16	6654	BT7	Eukaryota/CT
E17	8208	BT6	Plantae/CT
E18	747	BT5	Magnoliophyta/CT
E19	1370	BT4	Liliopsida/CT
E20	3	BT3	Cyperales/CT
E21	4351	BT2	Poaceae/CT
E22	9158	BT1	Cereal (grain)/CT
E23	33135	-->	Barley/CT HNTE Valid heading during volume 66 (1967) to present.
E24		UF	Hordeum sativum/CT
E25		UF	Mugi-cha/CT
E26		UF	Triticum hordeiforme/CT

```
***** END *****
```

=> E E22+ALL

E27	80085	BT2 Food/CT
E28	0	BT1 Plant-derived food (non-CA heading)/CT
E29	633	BT7 Organisms/CT
E30	6654	BT6 Eukaryota/CT
E31	8208	BT5 Plantae/CT
E32	747	BT4 Magnoliophyta/CT
E33	1370	BT3 Liliopsida/CT
E34	3	BT2 Cyperales/CT
E35	4351	BT1 Poaceae/CT
E36	9158	--> Cereal (grain)/CT HNTE Valid heading during volume 126 (1997) to present.
E37	6253	OLD Cereal/CT
E38	1828	OLD Cereals/CT
E39	486	OLD Cereals (plants and seeds)/CT
E40	1076	OLD Cereals and Grains/CT
E41	165	OLD Grain/CT
E42	1530	OLD Grains/CT
E43		UF Cereal grains/CT
E44		UF Gramineous crops/CT
E45	4234	NT1 Avena sativa/CT
E46	1	NT2 Avena sativa diffusa/CT
E47	3	NT2 Avena sativa nuda/CT
E48	33135	NT1 Barley/CT
E49	9176	NT1 Bran/CT
E50	3266	NT2 Wheat bran/CT
E51	381	NT1 Chenopodium quinoa/CT
E52	1	NT2 Chenopodium quinoa quinoa/CT
E53	61268	NT1 Corn/CT
E54	253	NT1 Eleusine coracana/CT
E55	3	NT2 Eleusine coracana africana/CT
E56	1670	NT1 Fagopyrum esculentum/CT
E57	14	NT2 Fagopyrum esculentum ancestrale/CT
E58	4	NT2 Fagopyrum esculentum esculentum/CT
E59	2	NT2 Fagopyrum esculentum homotropicum/CT
E60	10632	NT1 Hordeum vulgare/CT
E61	7	NT2 Hordeum vulgare agriocrithon/CT
E62	7	NT2 Hordeum vulgare akashinriki/CT
E63	0	NT2 Hordeum vulgare alfa/CT
E64	1	NT2 Hordeum vulgare brunneinudrum/CT
E65	1	NT2 Hordeum vulgare deficiens/CT
E66	0	NT2 Hordeum vulgare disticum/CT
E67	7	NT2 Hordeum vulgare harunanijo/CT
E68	3	NT2 Hordeum vulgare hexastichum/CT
E69	9	NT2 Hordeum vulgare nudum/CT
E70	1	NT2 Hordeum vulgare nutans/CT
E71	1	NT2 Hordeum vulgare pallidum/CT
E72	0	NT2 Hordeum vulgare polystichum/CT
E73	1	NT2 Hordeum vulgare rikotense/CT
E74	92	NT2 Hordeum vulgare spontaneum/CT

(continued on next page)

E75	1	NT2	Hordeum vulgare stendelii/CT
E76	0	NT2	Hordeum vulgare tetrastichum/CT
E77	241	NT2	Hordeum vulgare vulgare/CT
E78	1538	NT1	Panicum/CT
E79	3	NT2	Panicum amarulum/CT
E80	9	NT2	Panicum amarum/CT
E81	5	NT3	Panicum amarum amarulum/CT
E82	3	NT3	Panicum amarum amarum/CT
E83	1	NT2	Panicum anceps/CT
E84	50	NT2	Panicum antidotale/CT
E85	1	NT2	Panicum aquaticum/CT
E150	2	NT2	Panicum psilopodium/CT
E151	117	NT2	Panicum purpurascens/CT
E152	1	NT2	Panicum purpureum/CT
E153	1	NT2	Panicum pygmaeum/CT
E154	1	NT2	Panicum queenslandicum/CT
E155	3	NT2	Panicum ramosum/CT
E156	74	NT2	Panicum repens/CT
E157	1	NT2	Panicum rigidulum/CT
E158	1	NT2	Panicum ruderale/CT
E159	1	NT2	Panicum rudgei/CT
E160	3	NT2	Panicum sativum/CT
E161	2	NT2	Panicum schenkii/CT
E162	2	NT2	Panicum schinzii/CT
E163	1	NT2	Panicum sonorum/CT
E164	2	NT2	Panicum spathellosum/CT
E165	3	NT2	Panicum stapfianum/CT
E248	2	NT2	Zea mays everata/CT
E249	2	NT2	Zea mays everta/CT
E250	1	NT2	Zea mays flavorubra/CT
E251	13	NT2	Zea mays huehuetenangensis/CT
E252	27	NT2	Zea mays indentata/CT
E253	5	NT2	Zea mays indurata/CT
E254	1	NT2	Zea mays luxurians/CT
E255	69	NT2	Zea mays mays/CT
E256	52	NT2	Zea mays mexicana/CT
E257	56	NT2	Zea mays parviglumis/CT
E258	1	NT2	Zea mays rubrovelata/CT
E259	333	NT2	Zea mays saccharata/CT
E260	2	NT2	Zea mays tunicata/CT
E261	29116	RT	Feed/CT
E262	1973	RT	Prolamins/CT
E263	34939	RT	Seed/CT

***** END *****

=> S E36+PFT,NT

L6 231317 "CEREAL (GRAIN)"+PFT,NT/CT (225 TERMS)

Combine results:

```
=> S L5 AND L6

L7          143 L5 AND L6

=> S L7 OR L1

L8          176 L7 OR L1
```

Step 4. Analyze for IC and CC

```
=> ANA L8 1- IC CC

L9          ANALYZE L8 1- IC CC :      94 TERMS

=> D IC

L9          ANALYZE L8 1- IC CC :      94 TERMS

TERM #      # OCC  # DOC  % DOC  IC CC
-----
      7         6     6    3.41  A01H005-00
      8         6     6    3.41  C12N015-82
     13         3     3    1.70  C12Q001-68
     18         2     2    1.14  A01H001-04
     19         2     2    1.14  C12N
     20         2     2    1.14  C12N015-87
     21         2     2    1.14  C12P021-00
     29         1     1    0.57  A01H001-00
     30         1     1    0.57  A61K041-00
     31         1     1    0.57  B01D053-00
30 MORE TERMS WITH AN OCCURRENCE COUNT OF 1

=> D CC

L9          ANALYZE L8 1- IC CC :      94 TERMS

TERM #      # OCC  # DOC  % DOC  IC CC
-----
      1        28    28   15.91  8-3
      2        22    22   12.50  8-4
      3        16    16    9.09  3-1
      4        11    11    6.25  11-4
      5        11    11    6.25  3-2
      6         9     9    5.11  11-2
      9         5     5    2.84  3-3
     10         5     5    2.84  59
     11         4     4    2.27  11-3
     12         4     4    2.27  8-1
```

Step 5. Refine with IC

```
=> DEL EXP Y

=> E A01H005-00+INDEX/IC

E1      10423  -->  A01H005-00/IC
                    Flowering plants, i.e. angiosperms
*****  END***

=> E C12N015-82+INDEX/IC

E2      4625  -->  C12N015-82/IC
                    . . . . for plant cells (5)
*****  END***

=> E C12Q001-68+INDEX/IC

E3      32516  -->  C12Q001-68/IC
                    . involving nucleic acids (3)
*****  END***

=> S L8 AND E3

          32516C12Q001-68/IC
L10      3 L8 AND C12Q001-68/IC

=> D HIT 3

L10  ANSWER 3 OF 3  HCAPLUS  COPYRIGHT 2009 ACS
IC   ICM  C12Q001-68
IT   Gamma ray
      Radiation
      UV radiation
      X-ray
      (cleaving amplification products with; reverse genetic strategy
      for identifying functional mutations, TILLING (targeting induced
      local lesions in genomics) that combines chem. mutagenesis with a
      sensitive mutation detection)
IT   DNA
      RL: ARG (Analytical reagent use); BUU (Biological use,
      unclassified); ANST (Analytical study); BIOL (Biological study);
      USES (Uses)
      (labeled; reverse genetic strategy for identifying functional
      mutations, TILLING (targeting induced local lesions in genomics)
      that combines chem. mutagenesis with a sensitive mutation
      detection)
IT   Alfalfa (Medicago sativa)
      Animal
      Arabidopsis thaliana
      Barley
      Caenorhabditis
      Corn
      Cotton
```

(continued on next page)

DNA sequence analysis
 Denaturing gradient gel electrophoresis
 Drosophila
 Legume (Fabaceae)
 Melon (plant)
 Mutagenesis
 Mutagens
 Mutation
 Nucleic acid amplification (method)
 PCR (polymerase chain reaction)
 Pine (Pinus)
 Plant (Embryophyta)
Rice (Oryza sativa)
 SSCP (single-strand conformation polymorphism)
 Soybean (Glycine max)
 Tomato
Wheat
 (reverse genetic strategy for identifying functional mutations,
 TILLING (targeting induced local lesions in genomics) that
 combines chem. mutagenesis with a sensitive mutation detection)

Step 6. Refine with CC

=> E 8+ALL/CC

```

E4      251593  --> 8/CC
E5      19453   USE 8 CRYSTALLIZATION AND CRYSTAL STRUCTURE, 1962-
          1966/CC
E6      27857   USE 8 MICROBIAL BIOCHEMISTRY, 1967-1971/CC
E7      77134   USE 8 MINERALOGICAL AND GEOLOGICAL CHEMISTRY, 1906-
          1961/CC
E8      127149  USE 8 RADIATION BIOCHEMISTRY, 1972 TO PRESENT/CC
***** END *****
  
```

=> E RADIATION BIOCHEMISTRY+ALL/CC

```

E9      0       --> RADIATION BIOCHEMISTRY/CC
E10     9075    USE 5 RADIATION BIOCHEMISTRY, 1967-1971/CC
E11     5514    USE 59 RADIATION BIOCHEMISTRY, 1963-1966/CC
E12     127149  USE 8 RADIATION BIOCHEMISTRY, 1972 TO PRESENT/CC
***** END *****
  
```

=> S L8 AND 8/CC,SX RAN=1972,

```

          127149 8/CC
          53775 8/SX
L11     82 L8 AND 8/CC,SX
  
```

=> S L8 AND 5/CC,SX RAN=1967,1971

```

          9075 5/CC
          0 5/SX
L12     1 L8 AND 5/CC,SX
  
```

The section code thesaurus shows the changes in section number over time. Use range searches to cover the different time periods.

=> S L8 AND 59/CC RAN=1963,1966

L13 5514 59/CC
5 L8 AND 59/CC

=> S L11 OR L12 OR L13

L14 88 L11 OR L12 OR L13

=> D HIT 5 70 88

L14 ANSWER 5 OF 88 HCAPLUS COPYRIGHT 2009 ACS on STN
CC 17-10 (Food and Feed Chemistry)

Section cross-reference(s): 8

IT Allium fistulosum

Allium sativum

Cereal (grain)

Comet assay

Gamma ray

Garlic

Glycine max

Lycopersicon esculentum

Soybean

Tomato

Vegetable

(characteristics of DNA comet assay for irradiated vegetables and grains)

IT **DNA**

RL: BSU (Biological study, unclassified); BIOL (Biological study)

(characteristics of DNA comet assay for irradiated vegetables and grains)

IT **Rice**

(flour and meal; characteristics of DNA comet assay for irradiated vegetables and grains)

L14 ANSWER 70 OF 88 HCAPLUS COPYRIGHT 2009 ACS on STN

CC **8-3** (Radiation Biochemistry)

IT **Barley**

(DNA formation by cell nucleus of seeds of, γ -ray and nitroquinoline oxide effect on)

IT **Deoxyribonucleic acids**

RL: FORM (Formation, nonpreparative)

(formation of, by cell nucleus of barley seeds, γ -ray and nitroquinoline oxide effect on)

IT **Gamma ray, biological effects**

(on DNA formation, by barley seeds, nitroquinoline oxides in Relation to)

L14 ANSWER 88 OF 88 HCAPLUS COPYRIGHT 2009 ACS on STN

CC **59** (Radiation Biochemistry)

AB The effects of x-rays have been studied on chick embryo fibroblasts cultivated by the hanging drop method. Comparative actions of hard, soft and half-soft x-rays were studied for a dose of 400 r. Moreover, with hard rays only, two different intensities (rates) were made for 400 r., and effects of other doses (100, 200 and 800 r.) were compared. Growth was studied by mitotic-index and surface-area measurements for different times not exceeding 14 hrs. after irradiation, on fixed cultivated material. The **deoxyribonucleic acid (DNA)** content was estimated in . . .