

Ch/ChE 91: Scientific Writing Spring 2007

Literature Searching -- Dana Roth dzrplib@library.caltech.edu ext. 6423

Objectives:

- Overview of library resources at Caltech
- Google vs licensed databases (Web of Science / SciFinder Scholar)
- Basic techniques of literature searching, with reference to Chemistry
- Future research
- Cited References / Writing Resources

1. Overview of the CLS web page -- <http://library.caltech.edu/>

Library Catalog (CLAS)

A database of all the library owns or has paid access to: books, encyclopedias, journals, databases, etc.

Use the catalog for background information and specific known items

Search with author/editor names, titles, keyword, and subject headings.

1. Find books on a topic or known items:

Nanotechnology, Encyclopedia of Chemical Technology, etc.

Note LOC and Call Number and Status

Use Subject Headings for a known item to find related items

2. Find which journals and databases Caltech subscribes to:

Tetrahedron Letters, Macromolecules, SciFinder Scholar

Note extent of electronic availability

Find e-Journals

A listing of e-journals of possible interest at Caltech, many NOT full text.

CLS Database List (searchable descriptions)

'Find Databases' mirrors the CLS Database List but doesn't have descriptions.

For current research information you need to identify journal articles and conference abstracts or papers by searching in a journal article database.

There are numerous databases available. Each has a different format scope and area of subject coverage, and can overlap quite a bit.

Each has unique search commands and options, but all rely Boolean logic and Boolean operators. Each database has its own update schedule.

We will only look at the main ones for Chemistry. You need to know about these both this class but also along with others for your future research.

2. WARNING: You can find lots of 'stuff' on Google and much of it's unique BUT, Google is lacking most of the information you will find in Web of Science, SciFinder Scholar, Beilstein, Gmelin and the Combined Chemical Dictionary.

Google Scholar looks a little more promising. Scholarly journal articles show up—provided by some quality resources ... it also will list some books.

A closer at the results: A random order of the search results, both journal articles and books, no mention of the sources used, don't know what is missing.

3. Google Scholar is a interesting beta site, but suffers from some of the same problems as Google, namely it is incomplete ... so let's look at searching:

Web of Science <http://library.caltech.edu/>

SciFinder Scholar <http://library.caltech.edu/>

Beilstein / Gmelin <http://library.caltech.edu/>

Combined Chemical Dictionary <http://ccd.chemnetbase.com/>

WEB OF KNOWLEDGE

You can login from the Caltech Library Web Page [library.caltech.edu] and WoK is listed on the Quick Link menu.

ISI's Web of Knowledge includes: Web of Science (Science, Engineering, Medicine), INSPEC (Physics, EE & CS), & Medline (PubMed). CrossSearch allows combination searching of WoS, INSPEC, Medline, and AIAA Papers, Agricola, arXiv, Civil Engineering Database, ERIC Database, NTIS Reports, NASA ADS, Popline, & PubMed.

'Journal Citation Reports' currently provides 2003-2005 Impact Factor data for Science and Social Science journals (along with other features) and is updated ~June of each year.

'Please register for more features' allows you to: set 'My Preferences' (e.g. Web of Science as your start page); use the 'Saved Searches' option; and to view 'My Cited Articles List' (which you create by clicking 'Set up Citation Alert' on the full record page for a retrieved article).

'ISIHighlyCited.com' is a work in progress that will provide biographical and bibliographic information on preeminent researchers (e.g. Bjorkman, Goddard, Hoffmann, Simon, Marcus) in 21 subject categories.

Web of Science (see over)

WEB OF SCIENCE 1900-2007

General Search:

'Topic Search' ... the word or phrase is searched in the Title, Abstract, Author Keywords, Keywords Plus (in the titles of cited references). Topic searches can be restricted to Title words.

Truncation: * for 0-many / ? = 1 / \$ = 0 or 1

Boolean (Cell AND/OR/NOT Nanotube) and proximity operators (cell same nanotube) can be used. (Same = in ...title, same sentence in abstract, same keyword phrase).

'Search within results' allows limiting retrieval with additional keywords.

Clicking the SFX button provides links to Full Text, CLAS, IBID, End Note, Google, etc.

Sorting by 'Latest Date' (default), 'Times Cited', 'Relevance' (frequency of search terms), 'First Author', 'Source Title' and 'Publication Year' is possible for a maximum of 100,000 records.

'Analyze Results' by Author, Document Type, Institution, Source Title

'Output Records' to e-mail, print, save, EndNote. 'Add to Marked List' allows combining records

The 'Find Related Records' link (click 'i' for a full description) displays articles ranked by the number of shared references. There are now two columns displayed ... # of cited references (for that record) and # of shared citations (with the original record). Clicking on the 'Shared Refs' number displays these references and the 'View Record' link displays 'Full Source Index' records. An article's full 'Cited References' list is the default but it can be modified to limit which articles are to be related.

The default WoS databases and/or time frame can be changed by returning to 'General Search' and clicking on 'Change Settings'.

An e-mail notification service for either weekly or monthly updates on an author's articles or articles of a specific 'topic' is available with registration.

An 'author' or 'topic' e-mail notification is initiated by first searching for the 'author' or 'topic' and then clicking 'Search History'(on the menu bar), then 'Save History', then by editing the 'Server Save' fields (be sure to click 'Send Me E-mail Alerts') and then clicking 'Save'.

Cited Reference Search:

In a 'Cited Reference Search' ... we recommend searching with an author name and scrolling ... The 'cited work index' abbreviations for many journals have multiple forms (reflecting both policy changes & errors). The 'Thomson ISI journal list abbreviations' only gives current ISI abbreviations.

On the results page, mousing over the 'View record' link displays the article title.

Clicking on 'View record' displays the article's full record, which provides options to 'Create Citation Alert' (click 'Done' to return to the article record), or view 'Author Biography' (in ISI HighlyCited.com), or view 'Journal Citation Reports' which displays a 5 year record of the journal's ISI Impact Factor.

Comparison with other databases:

Web of Science is a journal article database (1900+), that also offers cited reference searching, and covers wide areas of science, engineering and medicine. WoS added author abstracts in 1992.

SciFinder Scholar consists of the following databases:

1. The CAplus file (based on the CA file - 1907+) includes over 21,600 records for journal articles dated before 1907 ... JACS (1879+) & J. Phys. Chem. (1898+), as well as their abstract sections for foreign articles and patents, plus several hundred landmark papers from 1900-1912.

Cited references are included for journals, conference proceedings, and basic patents from the US, EPO, WIPO, and German patent offices,(1997+), and patent examiner citations for British and French (2003+).

Bibliographic information and available abstracts are added for major country patents within 2 days, and for articles from more than 1,500 key chemical journals within 1 week of receipt, prior to full CA indexing. The CAplus File is updated daily with about 3,000 new bibliographic records and weekly with indexing for about 14,000 records.

2. The CA Registry file (3a) contains more than 31 million organic and inorganic substances and 58 million sequences. It is adding both experimental and calculated physical property data on a continuous basis.

Each substance in REGISTRY is identified by a unique CAS Registry Number(RN). While many other databases and publications contain CAS RNs, they may be incorrect or out-of-date. The REG file is the final authority for CAS Registry Numbers.

3. The CASReact file contains reaction information for ~12M reactions from both the organic and organometallic sections of CA: journals(1985+), patents(1991+), InfoChem: journals(1974-91), patents(1982-91), INPI Core Reactions(1840-85) and the Biotransformations Database(1971-1998).

Beilstein is an organic compound database used to find chemical and physical properties, preparations, and reactions. It covers the literature from the 1770s. It is especially useful for pre-1980 literature since its coverage is currently focused on ~180 organic synthesis journals.

Gmelin is an inorganic/organometallic compound database used to find chemical and physical properties, preparations and reactions. Literature coverage is uneven but dates from the 1770s (1c). It is useful for pre-1975 references, since it is currently only indexing ~100 journals.

Combined Chemical Dictionary is very useful for basic physical property information, derivatives and handy literature references (e.g., Aldrich Spectra, preparation, spectra, hazard info, etc.) and includes all compounds contained in the:

- Dictionary of Organic Compounds (~167,000 compounds + derivatives)
- Dictionary of Carbohydrates (~30,000 compounds + derivatives)
- Dictionary of Inorganic Compounds (~33,000 compounds + derivatives)
- Dictionary of Organometallic Compounds (~35,000 + derivatives)
- Dictionary of Natural Products (~80,000 compounds + derivatives)
- Dictionary of Analytical Reagents (~23,000 compounds)
- Dictionary of Drugs (~20,000 compounds)

Additional Databases/Publications of interest:

KIRK-OTHEMER ENCYCLOPEDIA OF CHEMICAL TECHNOLOGY

<http://www.mrw.interscience.wiley.com/kirk/>

ENCYCLOPEDIA OF POLYMER SCIENCE & TECHNOLOGY [electronic version], 2002+

<http://www3.interscience.wiley.com/cgi-bin/mrwhome/104554784/HOME>

Encyclopedia of Analytical Chemistry; Applications, theory and instrumentation. v.1-15, 2000

Encyclopedia of chemical physics and physical chemistry, v.1-3, 2001

<http://ecppc.iop.org/iop/default.jsp>

Encyclopedia of Computational Chemistry. v.1-5, 1998

Encyclopedia of Inorganic Chemistry. v.1-8, 1994

Encyclopedia of Nuclear Magnetic Resonance. v.1-9, 1996-2003

Encyclopedia of Reagents for Organic Chemistry (e-EROS)

<http://www3.interscience.wiley.com/cgi-bin/mrwhome/104554785/HOME>

MULTIVOLUME COMPILATIONS:

Chemistry of Functional Groups (Patai)

<http://www.wiley.com/WileyCDA/Section/id-11128.html>

Patai's 1992 Guide to the Chemistry of Functional Groups.

Comprehensive Coordination Chemistry; v.1-7, 1987; v. 1-10, 2004

Comprehensive Heterocyclic Chemistry; v.1-8, 1984; v.1-11, 1996

Comprehensive Natural Products Chemistry. v.1-9, 1999

Comprehensive Organic Functional Group Transformations. v.1-7, 1995; v.1-7, 2005

Comprehensive Organic Synthesis; v.1-9, 1991

Comprehensive Organometallic Chemistry; v.1-9, 1982; v.1-14, 1995; v. 1-13, 2006

Comprehensive Supramolecular Chemistry. v.1-11, 1996

Dana Roth's Chemistry Web Page: <http://library.caltech.edu/collections/chemistry.htm>

CLS Database List: <http://library.caltech.edu/databases/>

4. Future Research

CLS Database List <http://library.caltech.edu/databases/>

Web of Science: Saved Search Alerts / Citation Alerts

ACS Journal e-mail alerts / RSS Feeds <http://pubs.acs.org/alerts/index.html>

5. Cited References

ACS Style Guide [SFL REF and Mil-1 Reserve QD8.5 .A25 2006]

A Quick Guide to Citing using the ACS Style Guide, 3rd edition.

<http://www.libraries.psu.edu/pams/Quick%20Guide%20ACS.pdf>

The purpose of cited references is to identify all the relevant materials which have been consulted in the course of your research.

Acknowledging the source of borrowed information avoids plagiarism, and adds to your academic credibility, by supporting your views with concrete evidence.

Authors must acknowledge the sources of their information and ideas. Become familiar with the conventions for documenting intellectual debts, or you run the risk of being accused of plagiarism. Whether you actually quote the writers, or just rephrase their ideas in your own words, you must still provide a reference.

PLAGIARISM

Q: What is Plagiarism?

Many people think of plagiarism as copying another's work, or borrowing someone else's original ideas. But terms like "copying" and "borrowing" can disguise the seriousness of the offense. ***Plagiarism is an act of fraud. It involves both stealing someone else's work and lying about it afterward.***

Q: Can words and ideas really be stolen?

According to U.S. law, the answer is yes. In the United States (and many other countries) the expression of original ideas is considered intellectual property, and is protected by copyright laws, just like original inventions. Almost all forms of expression fall under copyright protection as long as they are recorded in some media (such as a book or a computer file).

Changing the words of an original source is not sufficient to prevent plagiarism. If you have retained the essential idea of an original source, and have not cited it, then no matter how drastically you may have altered its context or presentation, you have still plagiarized

Again, most cases of plagiarism can be avoided by citing sources. Simply acknowledging that certain material has been borrowed, and providing your audience with the information necessary to find that source, is usually enough to prevent plagiarism.

WHEN AND WHAT TO CITE

Q: What should I cite?

Everything you include in your paper that you have taken from another source (books, newspapers, web sites, etc.) no matter whether you quote the exact words or paraphrase the information in your own words.

Q: When do I need to cite?

Whenever you borrow words or ideas, you need to acknowledge their source. The following situations always require citation:

- Whenever you use quotes
- Whenever you paraphrase
- Whenever you use an idea that someone else has already expressed
- Whenever you make specific reference to the work of another
- Whenever someone else's work has been critical in developing your own ideas.

Q: When do I NOT need to cite?

- General knowledge (e.g. that George W. Bush is the President of the U.S.A.; that China has a larger population than Thailand)
- Information that is common knowledge in your field
- Ideas that are definitely your own, and findings or insights from your own

PARAPHRASING means putting an author's ideas or information into your own words:

There is a subtle art to indicating which are your ideas and which belong to another author. You should look at published work for examples for how to do this effectively.

Remember these things about paraphrasing:

- Paraphrasing is more generally used than quoting as it enables you to comment on, evaluate and summarize information
- Paraphrasing can be used with quotations (Note: you can quote within a paraphrase)
- Paraphrasing must always be referenced (because you are using someone else's ideas or information)
- Paraphrasing is never enclosed by quotation marks or indentation

Writing Resources <http://library.caltech.edu/reference/#writing>