

**Chemical Information Literacy Self Assessment** Name \_\_\_\_\_

**1. Research involves asking questions. Chemical literature can provide some of the important answers needed before, during and at the completion of experimental work. The following questions are commonly asked during research. List several SPECIFIC LITERATURE SOURCES that researchers could use to find answers:**

- a. Has a platinum(II) complex of trichloro-terpyridine already been prepared? Has anyone reported on the regulation of histidine activity in *Pseudomonas fluorescens* by adenosine 5-triphosphate?
- b. What is the Menshutkin reaction? What approaches are known for hydrogenation of an unsaturated neopentyl alcohol?
- c. What is the refractive index of ethylene glycol? or the melting point of 4-nitrostilbene?
- d. What are some applications of Wilkinson's catalyst, the Diels-Alder reaction or sonoluminescence?
- e. Is there an overview of experimental methods for polysaccharide structure determination? or a review of stereoselective electron transfer?
- f. Who are the major researchers in the area of non-linear optics?
- g. What are typical funding sources for research in natural product synthesis?
- h. What have been the major breakthroughs in research on molecular magnets?
- i. Where can I find safety and health hazard information on diethyl ether?

**2. Which of the following databases/search engines have you used? For which were you formally trained? Which are you comfortable using to find information on your research topic?**

- |                                  |      |         |             |
|----------------------------------|------|---------|-------------|
| a. Science Citation Index        | used | trained | comfortable |
| b. ACS Journal search            | used | trained | comfortable |
| c. Electronic Journal Center     | used | trained | comfortable |
| d. CONSORT and OhioLink catalogs | used | trained | comfortable |
| e. Chemical Abstracts (via STN)  | used | trained | comfortable |

**3. Searching the literature systematically involves generating and evaluating lists of citations. Based on the citations given below, answer the following questions:**

1. Moutet, J.-C.; Reverdy, G. *Nouv. J. Chem.* **1983**, 7, 105.
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4. Faulkner, L. R.; Bard, A. J. in *Electroanalytical Chemistry*; Bard, A. J., Ed.; Marcel Dekker: New York; 1977; Vol. 10, pp 1-95.
5. Skotheim, T. A., Ed. *Handbook of Conducting Polymers*; Marcel Dekker: New York, 1986.
6. Shirakawa, H.; Louis, E. J.; MacDiarmid, A. G.; Chiang, C. K.; Heeger, A. J. *J. Chem. Soc., Chem. Commun.* **1977**, 578.
7. Chiang, C. K.; Louis, E. J.; Druy, M. A.; Gau, S. C.; Heeger, A. J.; Louis, E. J.; MacDiarmid, A. G.; Park, Y. W.; Shirakawa, H. *J. Am. Chem. Soc.* **1978**, 100, 1013.
8. Frisch, M. J.; Trucks, G. W.; Schlegel, H. B.; Scuseria, G. E.; Robb, M. A.; Cheeseman, J. R.; Zakrzewski, V. G.; Montgomery, J. A.; Stratmann, R. E.; Burant, J. C.; Dapprich, S.; Millam, J. M.; Daniels, A. D.; Kudin, K. N.; Strain, M. C.; Farkas, O.; Tomasi, J.; Barone, V.; Cossi, M.; Cammi, R.; Mennucci, B.; Pommelli, C.; Adamo, C.; Clifford, S.; Ochterski, J.; Petersson, G. A.; Ayala, P. Y.; Cui, Q.; Morokuma, K.; Malick, D. K.; Rabuck, A. D.; Raghavachari, K.; Foresman, J. B.; Cioslowski, J.; Ortiz, J. V.; Stefanov, B. B.; Liu, G.; Liashenko, A.; Piskorz, P.; Komaromi, I.; Gomperts, R.; Martin, R. L.; Fox, D. J.; Keith, T.; Al-Laham, M. A.; Peng, C. Y.; Nanayakkara, A.; Challacombe, M.; Gill, P. M. W.; Johnson, B. G.; Chen, W.; Wong, M. W.; Andres, J. L.; Gonzales, C.; Head-Gordon, M.; Repogle, E. S.; Pople, J. A. *Gaussian 98*, Revision A1; Gaussian, Inc.: Pittsburgh, PA, 1998.
9. Dodabalapur, A.; Torsi, L.; Katz, H. E. *Science* **1995**, 268, 270.
10. Pei, Q.; Klavetter, F. US Patent Appl. No. 08/268763, June 28, 1994.
11. Cosman, M. Ph.D Dissertation, New York University, 1991.
12. Xu, R.; Mao, B.; Amin, S.; Geacintov, N. E. In preparation.
13. Roundhill, D. M. *Prog. Inorg. Chem.* **1995**, 43, 533.
14. Song, S.-Y.; Jang, M. S.; Shim, H.-K.; Song, I.-S.; Kim, W.-H. *Synth. Met.* **1999**, 102, 1116.
15. Ewen, J. A. *Sci. Am.* **1997**, 276 (5), 86-91.

- a. Which references are primary sources?
- b. Which reference is a secondary source?
- c. Which reference is a tertiary source?
- d. Which reference is a book?
- e. Which reference is a book chapter?
- f. Which reference is a review article?
- g. Which reference found in a monograph series?
- h. Is reference 9 available in print?
- i. Is reference 10 available in print?
- j. Which of the publications listed is in the most prestigious journal?
- k. Which reference is a communication, rather than a full reports?
- l. Which reference is a popular science magazine?
- m. Is reference 13 available at Kenyon?

**An Antibody-Catalyzed Isomerization Reaction**

*Tetsuo Uno, Jung Ku, James R. Prudent, Anita Huang, and Peter G. Schultz\** *J. Am. Chem. Soc.*, 118(16), 3811-3817

- n. Who is the primary author of this article?
- o. Who is the principle author of this article?

**4. The most important part of chemical information literacy is the ability to critically analyze the sources you find. In addition to understanding the science described in a primary journal article, a researcher must also understand the format and nature of the document. Which section of a primary research article (Introduction, Experimental, Results, Discussion, Conclusion, Acknowledgements) is appropriate for each of the following:**

- name of funding agency or office
- NMR spectroscopy data for a prepared compound
- an IR spectrum
- comparison of product yield to those typically found for similar compounds
- description of mechanism for catalytic reaction
- description of how spectroscopic solvents were purified
- description of potential applications related to this work
- the specific rate law to which kinetic data was fit to calculate rate constants

**5. Evaluating research in the context of the larger scientific community is part of a critical analysis.**

- Are you aware of any chemistry topics which are potential pitfalls for “junk science” or controversy?
- Do you know the names of any Chemistry Nobel Prizes laureates (or areas of research) from the past 10 years?

**6. Which of the following have you done at Kenyon?**

- oral presentation
- prepared a Powerpoint presentation
- created a web page
- prepared an annotated bibliography
- written a full lab report
- written a paper on a scientific research topic
- experience with importing/exporting electronic data (Excel data sheets or graphs, Chemdraw structures, spectra from instruments, etc.) for a presentation or paper
- reviewed another student’s science writing
- had your science writing reviewed by a peer

**7. Where might you use chemical information literacy after Kenyon?**

- medical/health professions school
- graduate school                      possible area(s) of specialization?
- teaching profession
- consulting
- legal profession
- service/non-profit organizations