UNIVERSITY OF KENTUCKY
DEPARTMENT OF CHEMISTRY
***CHE 610,* Chemistry of the Transition Metals**
Spring 2007
Term Paper Instructions

Due date: **Monday, April 16, 2007.**

Length: Minimum six pages of text, plus references and figures.

Format: Word-processing resources are available in most research groups and in UK's Computer Labs. Use a 12-point font, double spacing and *ca*. one-inch margins.

Figures: Interspersed in the text or collected at the end. Figures can be photocopied or scanned (at legible resolution) from primary references (*cite* the source), generated by using a drawing program such as *ChemDraw* or neatly hand-drawn.

References: Cite by number in the text. Collect and number the references at the end, formatted according to Table 14-2 in:
Dodd, J. S.; Solla, L.; Bérard, P. M., Chapter 14: References. In *The ACS style guide: effective communication of scientific information*, Third ed.; Coghill, A. M.; Garson, L. R., Eds. American Chemical Society: Washington, DC, 2006; pp 287-341.]
All word processors have italic and boldface fonts. You can use software such as EndNote to format your references automatically.

Here are examples of journal articles cited in American Chemical. Society format – with or without the title is acceptable. Use standard journal abbreviations.
(1) St. Clair, M.; Schaefer, W. P.; Bercaw, J. E. *Organometallics* **1991**, *10*, 525-527.
(2) Payne, M. M.; Parkin, S. R.; Anthony, J. E., Functionalized Higher Acenes: Hexacene and Heptacene. *J. Am. Chem. Soc*. **2005,** *127*, 8028-8029.

Style: Write in a scientific style suitable for publication in a review series such as *Chemical Reviews* or *Advances in Inorganic Chemistry*. *Instructions to Authors* that appear annually in the first issues of American Chemical Society journals such as *J. Am. Chem. Soc*. provide a general style guide and recommendations on citation format, proper abbreviations for scientific units, etc. More detailed guides to scientific writing are listed below.

Content: Use mainly **primary** sources, *i.e.,* scientific **journal articles**, not magazine articles or www pages. Part of the reason for this assignment is to familiarize you with finding and interpreting recent journal articles. The majority of your references should be from 2001 to 2007. **Do *not* simply paraphrase (plagiarize) reviews and textbooks.** A broad overview of old results is not appropriate for this term paper. Where appropriate, interpret the chemical literature rather than just listing results. If two or more authors disagree, express and defend your opinion about who is correct.

Topic: Submit a topic, printed or by e-mail, by **February 12, 2007**. Discuss possible topics with your instructor before that date. Include at least one reference a few sentences about the topic and why you chose it. Since your emphasis should be on current results, you may *narrow* your topic as you write. Your topic should be of current interest to inorganic chemists. Bioinorganic, environmental or materials chemistry topics are acceptable as long as you stress the inorganic chemistry, *not* strictly clinical results, field studies or engineering studies of devices. Avoid topics that require hard-to-get documents such as patents, government reports or obscure journals. Graduate students or undergraduates in CHE 395 should *not* choose a topic identical to their own research area.

Rough draft review: You may turn in a rough draft of your paper by **March 30, 2007**. The draft will not be graded, but I will evaluate it for content and form and return the comments to you. In this rough draft review, plagiarized text will be pointed out but not penalized. This optional review may be especially valuable to students who are not accustomed to writing technical English.

Because of this rough draft review option, I will strictly grade all aspects of the final paper, including grammar, format and original writing.

***Plagiarism*:** Stringing together abstracts and sections of articles with a few connecting words is plagiarism, whether you download the articles or retype the words. The student belief that a block of text with a certain fraction of the words or verb tenses changed does not constitute plagiarism is an urban legend. The University defines plagiarism and other academic offenses very clearly in Sections 6.3.0 to 6.3.2 of the Student Rights and Responsibilities handbook. All students should have received this publication when they entered the University. If you would like to obtain a printed copy, please consult the Chemistry main office staff. Penalties for academic offenses such as plagiarism or cheating on exams range from an "E" for the course (the minimum penalty) to expulsion from the University.

A relevant excerpt from the University code follows.

6.3.1 PLAGIARISM

All academic work, written or otherwise, submitted by students to their instructors or other academic supervisors, is expected to be the result of their own thought, research, or self-expression. In cases where students feel unsure about a question of plagiarism involving their work, they are obliged to consult their instructors on the matter before submission.

When students submit work purporting to be their own, but which in any way borrows ideas, organization, wording or anything else from another source without appropriate acknowledgment of the fact, the students are guilty of plagiarism.

Plagiarism includes reproducing someone else's work, whether it be a published article, chapter of a book, a paper from a friend or some file, or whatever. Plagiarism also includes the practice of employing or allowing another person to alter or revise the work, which a student submits as his/her own, whoever that other person may be. Students may discuss assignments among themselves or with an instructor or tutor, but when the actual work is done, it must be done by the student, and the student alone.

When a student's assignment involves research in outside sources or information, the student must carefully acknowledge exactly what, where and how he/she has employed them. If the words of someone else are used, the student must put quotation marks around the passage in question and add an appropriate indication of its origin. Making simple changes while leaving the organization, content and phraseology intact is plagiaristic. However, nothing in these Rules shall apply to those ideas that are so generally and freely circulated as to be a part of the public domain.

Oral presentations: Each student will give a 20–30 minute presentation based on his or her paper during the last week or two of class. Any format from chalk talk to PowerPoint is acceptable. Copying huge blocks of text into a PowerPoint file does not lead to an effective presentation. The presentation will count for 25% of the paper grade (i.e., 5% of the course grade).

Writing guides: Several of these guides are on reserve in the Chemistry-Physics library.

1. *The ACS style guide: effective communication of scientific information*, Third ed.; Coghill, A. M.; Garson, L. R., Eds. American Chemical Society: Washington, DC, 2006.
2. *The Chemist's English, Third Edition*, R. Schoenfeld; VCH, Weinheim, New York, 1989.
3. *The Art of Scientific Writing*, H. F. Ebel, C. Bliefert, W. E. Russey; VCH, Weinheim, New York, 1987.
4. *Writing with Style: Conversations on the Art of Writing, Second Edition*, J. R. Trimble; Prentice Hall, 2000.
5. *The Elements of Style, Fourth Edition*, W. Strunk Jr., E. B. White; Pearson Higher Education, 2000.
6. *A Manual for Writers of Term Papers, Theses, and Dissertations, Fourth Edition*, K. Turabian; University of Chicago Press, 1973.

Topics: You may choose a topic from this list or, preferably, from any area of transition-metal chemistry that interests you. These general topics are too broad – you will need to focus a more specific topic for a six-page paper. Do not write a paper on your own research project or one in your research group.

Nanotechnology: size effects on physical properties of materials; synthesis and properties of nanoparticles; applications

Solid-state ionic conductors

Novel magnetic materials

New approaches to glasses: sol-gel chemistry

High-tech ceramics: concentrate on chemistry (e.g., new syntheses) rather than applications

Bioinorganic chemistry: recent advances in metalloenzymes such as nitrogenase, methane monooxygenase; metal transport or concentration processes

Inorganic radiopharmaceuticals (emphasize chemistry, not clinical results)

Inorganic compounds as NMR imaging contrast agents

Cluster chemistry: very large transition-metal clusters, mixed main-transition metal clusters, organic transformations on clusters

Chemical vapor deposition: new methods for depositing films of transition metal-containing materials (emphasize chemistry, not engineering)

Ligand design: ligands that hold two metal atoms near one another, ligands for asymmetric catalysis, etc.

Organometallic polymers: specific new developments

Intercalation compounds: specific new developments

Isopoly- and heteropolymetallates, e.g., new organic-soluble systems, surface-bound organometallics, structure determination by NMR

Transition metal-element bonds: new combinations, reaction chemistry, unusual bond orders

Transition-metal superacids

Polymerization catalysis: specific new developments

Super-reduced metal carbonyls: metals in negative oxidation states

Electron-transfer reactions: new inorganic aspects

Transition metal-containing zeolites

Chemistry of gas-phase metal atoms, bimetallics and clusters

Metallacarboranes, "inorganometallic chemistry"

Alkalides and electrides of f-metals

Physical and spectroscopic methods: modern applications, emphasizing inorganic chemistry rather than spectroscopic details