

Chemistry 7010

Descriptive Inorganic Chemistry
 Fall 2009
 11:45 a.m.–12:40 p.m. MWF
 1111 Old Main

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TENTATIVE LECTURE SCHEDULE (EXAM DATES ARE FIRM)

Subject	Week	Greenwood Chapter	Subject	Week	Gopen Chapter
Basics of Chemical Bonding	1–3	1,2	Punctuation Part 1: :, ;, -, —, (), [].	1	Part 2
Hydrogen, Group 1, Group 2	4	3–5	Punctuation Part 2: !, ?, ', ..., ,, ..	2	Part 2
Boron, Group 13	5	6,7	Action	3	2,3
Carbon, Group 14	6	8–10	Whose Story?	4	2,3
Nitrogen, Group 15	7	11–13	Stress Position	5	2,3
Oxygen, Group 16	7	14–16	Artificial Emphasis and Backward Links	6	3
Group 17	8	17	Topic Changing	7	3
Group 18	8	18	Topic Stringing	8	3
Group 12	9	29	Flow from Sentence to Sentence	9	3
Coordination Chemistry	9–10	19	Paragraph Issues	10	4
1st Row Transition Metals	11–12	20–28	Paragraph Points	11	4
2nd and 3rd Row Transition Metals	13–14		Paragraph Connections	12	4
Lanthanides, Actinides	15	30, 31	Bad Advice	13	5

Abstract Due Dates (All Monday): September 21, 28; October 19; November 2, 16

Midterm Exams: Monday, October 5, 6:30 p.m. Room 1111 Old Main
 Wednesday, November 11, 6:30 p.m. Room 0105 Old Main

Final Exam: Thursday, December 17, 10:40 a.m.–1:10 p.m. Room 1111 Old Main

Interview Project: 1st draft (5 copies) due Friday, October 2, in class
 Comments due Wednesday, October 28, in class
 2nd draft (3 copies) due Friday, November 6, in class
 Comments due Wednesday, November 18, in class
 Final draft (2 copies) due Friday, December 4, in class

GOALS: There are two primary goals for this course: (1) To obtain a broad foundation of knowledge necessary for pursuing research in inorganic chemistry and (2) to develop writing and critical reading skills necessary for pursuing research in inorganic chemistry.

PREREQUISITE: CHM 5020 or equivalent.

REQUIRED TEXTS: Greenwood and Earnshaw *Chemistry of the Elements, Second Edition* and Gopen *The Sense of Structure: Writing from the Reader's Perspective*, available in the bookstore.

COMMUNICATION: E-mail correspondence sent to Professor Allen must contain “CHM 7010” in the subject line.

OFFICE HOURS: Walk in or by appointment.

GRADING: The two midterm exams are worth 100 points each. Combined writing assignments (5 abstracts (4 points each), 2 page interview paper (48 points), and peer review (32 points)) are worth 100 points. The Final exam is worth 200 points. No make-up exams will be given, and no late assignments will be accepted. If you must miss an exam for an emergency, speak with me as far in advance as possible.

PARTICIPATION IN CLASSROOM DISCUSSION: Participate! Ask questions! I will assign up to 25 points of “Classroom Discussion” credit at the end of the semester. Yes, this is real.

PLAGIARISM: Plagiarism will not be tolerated and will result in a failing grade on the assignment for the first offense and a failing grade in the course for the second offense.

GUIDELINES FOR WRITING AN ABSTRACT FOR A SCIENTIFIC PAPER:

(Summarized from *The ACS Style Guide, Third Edition*, American Chemical Society: Washington, DC, 2006, 21–22.)

1. The purpose of an abstract is to allow the reader to determine the nature and scope of the research paper.
2. The abstract must be concise, self-contained and complete enough to appear separate from the publication.
3. For a research paper:
 - a. Briefly state the research topic, problem, or purpose of the research; to do this, you must comprehend the “big picture”.
 - b. Indicate the theoretical or experimental plan used.
 - c. Summarize the principle findings.
 - d. Point out the major conclusions or implications.
4. For a review paper, the abstract should identify the topic, the scope, the sources reviewed and the conclusions.
5. The optimal length for an abstract is one paragraph, but it may be as short as two sentences. The length will depend on the subject matter and the length of the paper, but 80–200 words is usually adequate.
6. Do not cite references, tables, figures, or sections of the paper in the abstract. Do not include equations, schemes, or structures that require display on a line separate from the text.
7. Use abbreviations and acronyms only when it is necessary to prevent awkward construction or needless repetition. Define abbreviations at first use in the abstract (and again at first use in the text).
8. **All abstracts must be typed.**

INTERVIEW PROJECT: This project will consist of brief report (1200–1500 words) of the use of elements by research groups in the department. You will be randomly assigned a faculty member and a group of elements, and you will write a description of the use of your assigned elements in the research group. The information for your report should be acquired through reading papers from the group, interviewing the faculty member, and interviewing group members.

Two rounds of peer-review will be performed prior to the final due date. You will receive specific instructions for peer-reviewing in class. Grades will be assigned based on the quality of the final reports (60%) as well as the quality of your reviews of the reports of your classmates (40%).

Specific Guidelines for Papers: Use Times New Roman (12 point) font. Use 1 inch margins all around. Double space the document, and include at least one figure per page. References should be formatted according to the guidelines in the *ACS Style Guide*.

Periodic Table

1		Relative atomic mass
1.0	H	Symbol
1	Hydrogen	Atomic number

18		Relative atomic mass
4.0	He	Symbol
2	Helium	Atomic number

Key
 Those numbers appearing within brackets are the mass numbers of common isotopes
 Those elements underlined are radioactive

N	element is a gas	}	at room temperature and pressure
Hg	element is a liquid		
Li	element is a solid		

6.9 Li Lithium 3	9.0 Be Beryllium 4
23.0 Na Sodium 11	24.3 Mg Magnesium 12
39.1 K Potassium 19	40.1 Ca Calcium 20
85.5 Rb Rubidium 37	87.6 Sr Strontium 38
132.9 Cs Caesium 55	137.3 Ba Barium 56
(223) Fr <u>Francium</u> 87	(226) Ra <u>Radium</u> 88

3	4	5	6	7	8	9	10	11	12
45.0 Sc Scandium 21	47.9 Ti Titanium 22	50.9 V Vanadium 23	52.0 Cr Chromium 24	54.9 Mn Manganese 25	55.8 Fe Iron 26	58.9 Co Cobalt 27	58.7 Ni Nickel 28	63.5 Cu Copper 29	65.4 Zn Zinc 30
88.9 Y Yttrium 39	91.2 Zr Zirconium 40	92.9 Nb Niobium 41	95.9 Mo Molybdenum 42	(99) Tc <u>Technetium</u> 43	101.1 Ru Ruthenium 44	102.9 Rh Rhodium 45	106.4 Pd Palladium 46	107.9 Ag Silver 47	112.4 Cd Cadmium 48
138.9 La Lanthanum 57	178.5 Hf Hafnium 72	181.0 Ta Tantalum 73	183.9 W Tungsten 74	186.2 Re Rhenium 75	190.2 Os Osmium 76	192.2 Ir Iridium 77	195.1 Pt Platinum 78	197.0 Au Gold 79	200.6 Hg Mercury 80
(227) Ac <u>Actinium</u> 89	(261) Rf <u>Rutherfordium</u> 104	(262) Db <u>Dubnium</u> 105	(263) Sg <u>Seaborgium</u> 106	(262) Bh <u>Bohrium</u> 107	(265) Hs <u>Hassium</u> 108	(266) Mt <u>Meitnerium</u> 109			

13	14	15	16	17	18
10.8 B Boron 5	12.0 C Carbon 6	14.0 N Nitrogen 7	16.0 O Oxygen 8	19.0 F Fluorine 9	20.2 Ne Neon 10
27.0 Al Aluminium 13	28.1 Si Silicon 14	31.0 P Phosphorus 15	32.1 S Sulphur 16	35.5 Cl Chlorine 17	39.9 Ar Argon 18
69.7 Ga Gallium 31	72.6 Ge Germanium 32	74.9 As Arsenic 33	79.0 Se Selenium 34	79.9 Br Bromine 35	83.8 Kr Krypton 36
114.8 In Indium 49	118.7 Sn Tin 50	121.8 Sb Antimony 51	127.6 Te Tellurium 52	126.9 I Iodine 53	131.3 Xe Xenon 54
204.4 Tl Thallium 81	207.2 Pb Lead 82	209.0 Bi Bismuth 83	(210) Po <u>Polonium</u> 84	(210) At <u>Astatine</u> 85	(222) Rn <u>Radon</u> 86

140.1 Ce Cerium 58	140.9 Pr Praseodymium 59	144.2 Nd Neodymium 60	(147) Pm <u>Promethium</u> 61	150.4 Sm Samarium 62	152.0 Eu Europium 63	157.3 Gd Gadolinium 64	158.9 Tb Terbium 65	162.5 Dy Dysprosium 66	164.9 Ho Holmium 67	167.3 Er Erbium 68	168.9 Tm Thulium 69	173.0 Yb Ytterbium 70	175.0 Lu Lutetium 71
232.0 Th <u>Thorium</u> 90	(231) Pa <u>Protactinium</u> 91	238.1 U <u>Uranium</u> 92	(237) Np <u>Neptunium</u> 93	(244) Pu <u>Plutonium</u> 94	(243) Am <u>Americium</u> 95	(247) Cm <u>Curium</u> 96	(247) Bk <u>Berkelium</u> 97	(251) Cf <u>Californium</u> 98	(252) Es <u>Einsteinium</u> 99	(257) Fm <u>Fermium</u> 100	(258) Md <u>Mendelevium</u> 101	(259) No <u>Nobelium</u> 102	(260) Lr <u>Lawrencium</u> 103

* 58-71 Lanthanide series

† 90-103 Actinide series