

CHEM 713 – Chemistry of the Elements

Fall 2017, 2:25 PM MWF – Room 2307

Credits: 3

Instructor: Prof. John F. Berry, Room 6357, 262-7534, berry@chem.wisc.edu

Goals: There are three things I would like for you to take away from this course. (1) To develop an intuition for chemical reactivity necessary for pursuing research in synthetic chemistry, (2) to develop writing skills and learn to read and critically evaluate the literature, and (3) to learn to use tools to search the chemical literature.

Textbook: Greenwood, N. N.; Earnshaw, A. *Chemistry of the Elements*, 2nd edition, Butterworth Heinemann: Oxford, 1998. The textbook is recommended but not required. Supplementary texts are available in the library.

Syllabus:

Part 1: Overview of the Periodic Table

Part 2: The Main Group Elements

Hydrogen, Group 1 and Group 2

Boron, Group 13

Carbon, Group 14

Nitrogen, Group 15

Oxygen, Group 16

Group 17

Group 18

Zinc, Cadmium, and Mercury

Part 3: The Transition Elements

Introduction to Coordination Chemistry

Ligand Field Theory

The Elements of the First Transition Series

The Elements of the Second and Third Transition Series

Scandium, Yttrium, Lanthanum, and the Lanthanides

The Actinide and Transactinide Elements

Office Hours: My office door is always open when I am available. Feel free to stop by any time.

Grading:	The following scheme shall be used:	
	25 Elementary Information Exercises:	125 points
	One first exam:	100 points
	One second exam:	100 points
	Two CSD projects:	100 points (50 points each)
	One special project:	<u>100 points</u>
		525 points

Elementary Information Worksheets: I will give you 26 element worksheets throughout the semester in preparation for upcoming class discussions. You will use these sheets to gather the vital information about each element or set of elements including their sources in Nature, information on processing, their important compounds, and their reactivity. 25 of these will be graded for up to 5 points for 5 correct problems. These worksheets are due on the day that we are scheduled to discuss the topical element. You can use these worksheets during exams.

Exams: Exam 1 – Friday, Oct. 28th at 7:00 PM
 Exam 2 – Wednesday, Dec. 14th at 7:00 PM

CSD Projects: To be announced

Special Project: See attached sheet

Extra Points Available: *Abstracts*. Every now and then (roughly 10 times during the semester) I will give you a paper about some aspect of inorganic chemistry from the literature with the abstract missing. I want you to write an abstract for the article. If you write an abstract, you will get up to 5 bonus points. Do not just find the original abstract and copy it – this would be plagiarism. The purpose is for you to learn how to read a

paper, find the most important aspects of the paper, and to develop your writing skills. The abstracts will be corrected for content and grammar.

Participation in Classroom Discussion. Lectures in which I talk and students listen passively can be kind of boring. Participate! Ask questions! I want to share with you my ways of thinking about the chemistry of the elements, but I want to know what you think, too!