

Preview Sheet for Test 2
Periodic Trends in Atomic Properties and Chemical Bonding

Thursday, October 18, 9:00 – 11:00 a.m., OR 101

Chapter 1 (pp. 40-46), Chapter 2 (pp. 60-83), Chapter 3 (pp. 95-106; 115-123)

Lectures from 9/24 to 10/12; Problem Sets 4, 5, and 6

Studying strategies:

- Focus on your lecture notes and homework first, then look at the textbook. Anticipate some conceptual questions not based on the homework.
- If a topic was not covered in homework or in lecture, you are not responsible for it! Please ask me if you are unsure about whether a particular topic is “fair game” for the exam.
- Some specific things you should know (not a comprehensive list!): the in-class demonstrations, resonance (it does not involve the movement of nuclei!), the basic ideas of VSEPR theory from Experiment 4, the molecular orbital diagrams for diatomic molecules.
- Some specific things not to worry about: the VSEPR names of molecular geometries, hybridization, molecular orbital theory for polyatomic molecules.
- Do extra problems at the ends of the chapters. In particular, work the odd-numbered exercises paired with the even-numbered exercises you were assigned for homework. (The answers to the odd-numbered exercises are in Section C at the back of your textbook.) If you are stuck on a problem, please come talk with me or one of the student tutors:

Chem Major Tutoring Schedule
(in Olin-Rice 341):

Sunday: 1:00 – 10:00 p.m.

Monday – Thursday: 7:00 – 10:00 p.m.

MAX Center Tutoring:

Sunday – Thursday: 7:00 – 10:00 p.m.

Monday – Friday: 9:00 a.m. – 4:30 p.m.

My Office Hours:

Monday: After 2:30 p.m.

Tuesday: Before noon

Wednesday: 1:30 – 3:30 p.m.

[From the test booklet:]

Instructions before starting the test:

1. Write your name in the space above and on the backs of the other pages.
2. This exam is closed-everything.
3. Your exam booklet should have **eight** pages total, with questions on pp. 2-7, and a periodic table, equations and other reference data on p. 8. Check to see you have eight pages now. If you do not, ask for another copy of the exam.

- You may use programmable calculators, but chemical data should not be stored in them.
- To receive full credit for a mathematical problem, you must show the method by which you obtained the final answer, including dimensional analysis. However, you do not need to justify how you calculated molar masses.
- A final numerical answer must contain the correct units and number of significant figures to receive full credit.
- You have **120 minutes** to work on this exam. Do not start until you are instructed to.

What not to memorize (they will be provided in the test booklet):

- The periodic table
- The information below:

$$E_p \propto \frac{q_1 q_2}{r_{12}} \quad c = \lambda \nu \quad \frac{1}{\lambda} \equiv \tilde{\nu} \quad E = h\nu \quad E_K = \frac{1}{2}mv^2$$

$$L = n \frac{\lambda}{2} \quad \lambda = \frac{h}{mv} \quad E_K = \frac{n^2 h^2}{8mL^2}$$

$$N_A = 6.022 \times 10^{23} \text{ particle mol}^{-1} \quad h = 6.626 \times 10^{-34} \text{ J s particle}^{-1} \quad c = 2.998 \times 10^8 \text{ m s}^{-1}$$

$$1 \text{ m} = 10^9 \text{ nm} = 10^{10} \text{ \AA} \quad 1 \text{ J} = 1 \text{ kg m}^2 \text{ s}^{-2} \quad 1 \text{ kcal} = 4.184 \text{ kJ}$$

Test-Taking Tips

- Read the problems carefully.
- Pace yourself. Try to make your effort on a given problem proportional to the number of points that it is worth.
- If you can't figure out how to begin a problem after thinking about it for a couple of minutes, go on to the next problem.
- Please ask Prof. Fischer (who will be proctoring the exam) if a question doesn't make sense.