

Chemistry 1B Semester Homework Assignment
Kotz and Treichel, **SIXTH** edition.

- Quizzes and exams are based on lecture notes / class discussion, problems given through worksheets and problems given through textbook assignments.
- My philosophy about the homework is that you do as much as you need to do in order to understand the concepts and math problems thoroughly. You may ask me to review any of your homework assignments during “official” office hours, or any time after class, but I will not collect the homework assignments.
- My quizzes and exams test both problem solving ability (math problems) and comprehension (answering verbal questions), which includes an understanding of what each variable in a formula means, as well as an understanding of what happens physically between the atoms/molecules in a particular experiment or situation. Keep this in mind when working on your homework problems.
- You will be responsible for doing the homework that corresponds to the information we discuss in class. So review your notes to determine how far you should be going in the problems for each chapter. Also check the website for the quiz and test information.
- Remember there are no graphing calculators on quizzes or exams.

Chapter 23

Don't worry about learning names, dates, scientists and experiments unless we discuss them explicitly in class. In general, I will not be testing you on historical facts. The problems assigned below are fair game, so pay attention to those with verbal answers.
Problems: (4-10 all), (12-40 even), 46, 48, 49, 50, 52, 55, 56, 58, 60, 62, 64.

Chapter 15

Problems: Answer the following verbal questions.

1. Considering chemical reactions at the particulate level, explain how temperature, reactant concentrations, and catalysts affect reaction rates.
2. A reaction has the experimental reaction rate equation $\text{Rate} = k[\text{A}]^2$. How will the rate change if the concentration of A is tripled? If the concentration of A is halved?
3. After five half-life periods for a first-order reaction, what fraction of the reactant remains?
4. Plotting $1/[\text{reactant}]$ versus time for a reaction produces a straight line. What is the order of the reaction? If a straight line of negative slope is observed for a plot of $\ln[\text{reactant}]$ vs. time, what is the order of the reaction?
5. Draw a reaction coordinate diagram for a single-step exothermic process. Mark the activation energies of the forward and reverse processes. Identify the net energy change for the reaction in this diagram.
6. Define what is meant by the term “mechanism” for a chemical reaction.
7. Define the terms “elementary step” and “rate-determining step” as applied to mechanisms.
8. What is a reaction intermediate? Give an example using one of the reaction mechanisms described in the text.
9. What is a catalyst? What is the effect of a catalyst on the mechanism of a reaction?

Textbook problems: 1-53, odd problems.
Also 63, 67, 69, 70, 71, 73, 75, 93.

Chapter 16

Review the Equilibrium worksheet we did in lab.

Problems 1, 5, (9-33) odd, [36 Ans. (a) No, Q is not equal to K . b) $Q < K$, shifts to right, c) $[N_2] = [O_2] = 0.25$ M, $[NO] = 0.0102$ M], 37, 39, 41, 43, [44 Ans. $K_p = 2.31 \times 10^{-4}$], 45, 47, 53, 55, 63, 69.

Chapter 17

Problems: You should be able to do any of the odd numbered problems from 1 – 103. Also include 111, 113 – these are important. OMIT problems 85, 91, 99, 105, 107, 115, 117.

Chapter 18

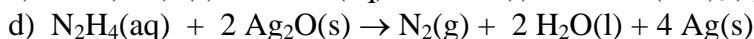
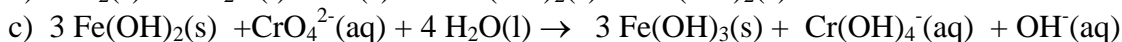
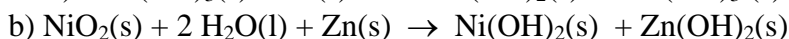
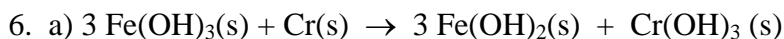
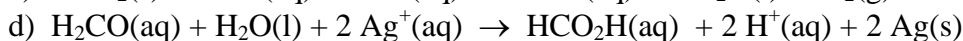
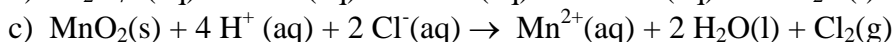
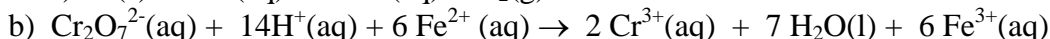
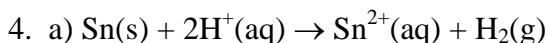
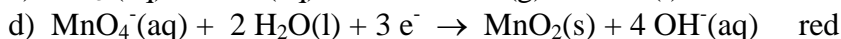
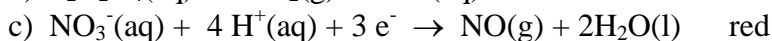
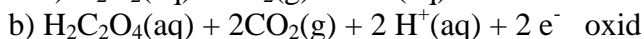
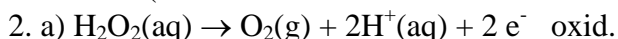
Problems: 1-15 odd, 19-25 odd, [29 and 31: match the pH at the equivalence point so that it comes within the middle of the pH range of an indicator], 37-55 odd, [57 consider the hydrolysis reaction of each ion and Le Chatelier's principle], 59-67 odd, 71-81 odd, 85, 87, [91 this is a combination of 2 equilibria: figure out the 2 reactions and the K constants for each and figure out the K constant for the two reactions (review ch. 16 section 5)], 97.

Chapter 19

Problems: 1 and 3 – explain your choice), 5, 7, 9 (write the equation for the formation process), 11-35 odd, 37, 39, 41 (explain prediction), 43 – 51 odd, 53 (explain prediction), 55, 57, 61-69 odd, 73-85 odd (85 - part a only).

Chapter 20

Problems: (1-6 all – answers to even numbers below), 7-81 odd, 85.



Chapter 22

Problems: 1, 3, 7, 9, 11, 19, *20, 21, *22, 23, 27, 29, 31, 35, *38, 39, 41, *42, 43, 47, 51, 53, 55, 57, 59.

*20 [Ans. a) possible, cis/trans b) possible fac/mer c) possible fac/mer d) not possible]

*22 [Ans. 2 isomers have one set of trans ligands, chiral isomers have only cis isomers]

*38 [Ans. a) no b) yes c) no]

*42 [Ans. a) +3 b)6 c) octahedral d) 1 unpaired electron e) paramagnetic f) 3 isomers]