

CHEMISTRY 1212 FINAL EXAM STUDY GUIDE SPRING 2009

- ◆ The Final Exam is a **written exam** consisting of short answer questions and calculations from Lab Safety and Experiments 10 - 20.
- ◆ You will **NOT** be allowed to use your lab manual or your lab notebook.
You will **NOT** be allowed to share a calculator.
You will **NOT** be allowed to use a graphing calculator.
- ◆ You must show all of your work to receive full or partial credit on a question. Even if the answer is correct, if you do not show your work you will not receive credit.
- ◆ You will have **1.5 hours** to complete the exam. Exam will be given in your lab at your regular class time. Bring pencil or pen and calculator (scientific) to the exam.
- ◆ **Best Studying Tip 1:** *Review the quizzes and the pre-lab and post-lab questions at the end of each experiment.*
- ◆ **Best Studying Tip 2:** *Know the formulas/equations and how to use them. For example, you need to know how to calculate moles from either mass or M & L. (You will be given constants and the **molar mass (molecular weights)** of the various compounds.)*
- ◆ **Best Studying Tip 3:** *On the CHEM 1212 web page, there are links to copies of the overhead transparencies. If you do not remember how to do a calculation or want to review the other points of the pre-lab lecture, go to this site.
<http://chemistry.lsu.edu/lallen/1212.html>*

Formulas used in Experiments 10 – 20 (WILL NOT BE GIVEN)

$$\text{Density (g/mL)} = \text{mass (g)} / \text{volume (mL)}$$

$$\text{moles} = \text{Mass(g)} / \text{Molar Mass(g/mol)} \quad \text{or} \quad \text{Mass(g)} = \text{moles} \times \text{MM(g/mol)}$$

$$\text{Molarity (M)} = \text{moles} / \text{L} \quad \text{or} \quad \text{moles} = \text{Molarity} \times \text{L}$$

$$\text{Dilution: } M_{\text{conc}} \times L_{\text{conc}} = M_{\text{dilute}} \times L_{\text{dilute}}$$

use stoichiometric ratio of moles to convert from moles of A to moles of B

$$\text{Percent yield} = (\text{actual yield} / \text{theoretical yield}) \times 100\%$$

$$\Delta T_f (^{\circ}\text{C}) = K_f(^{\circ}\text{C/molality}) \times \text{molality}(m) \quad \text{and} \quad \text{Molality} = \text{moles of solute/kg of solvent}$$

$$\text{pH} = -\log [\text{H}^+] \quad \text{or} \quad -\log [\text{H}_3\text{O}^+]$$

$$q (\text{heat}) = \text{specific heat (J/g}^{\circ}\text{C)} \times \text{mass(g)} \times \Delta T(^{\circ}\text{C)}$$

$$q_{\text{system}} = (-) q_{\text{surroundings}} \quad \text{and} \quad \Delta H_{\text{rxn}} = q_{\text{rxn}} / \text{mol}$$

$$\text{Rate} = (-) \Delta[\text{Reactant}] / \Delta\text{time}$$

$$\text{Rate} = k [\text{A}]^m [\text{B}]^n$$

$$\log \{\text{ratio of rates}\} / \log \{\text{ratio of concentrations}\} = m$$

Lab Safety Review the Laboratory Safety section in the lab manual.

- 10 Be able to calculate the molality of a solution and its theoretical freezing point. Know the relationship between molality and freezing point. How would errors affect results?
- 11 Be able to determine the approximate pH of a compound using sample data. Be able to do pH calculations and to rank solutions by increasing or decreasing acidity (or basicity). Know acidic, basic properties and how they are affected by dilution.
- 12-15 Be able to identify cations from all of the Qual. Groups in an unknown from sample data sheets & flow charts. Be able to fill in inferences/chemical formulas on a data sheet. Be able to write rationales on the identity of an unknown solution from sample data sheet information.

Be able to choose a reagent to distinguish between cations (like pre- and post-lab questions).
- 16 Be able to calculate q , specific heat, and ΔH_{rxn} from sample data. Understand the basic principles of calorimetry and how errors would affect results.
- 17 Be able to interpret & explain observations (in terms of Le Châtelier's principle) concerning an equilibrium system when adding (or removing) heat or chemicals.
- 18 Be able to determine the rate of reaction, individual orders of reaction, overall order of reaction, rate constant, and the Rate Law from experimental or described data. How would errors (ex. Time is too long) affect the results?
- 19 Be able to determine which species is the oxidized species, reduced species, oxidizing agent and/or reducing agent from sample data.
- 20 Be able to calculate theoretical and % yields from sample data. Be able to describe what recrystallization does and its affect on the yield.

Grade = Notebook Ave. + Quiz Ave. + (Midterm Exam x 0.3) + (Final Exam x 0.3)

The grading scale as stated in the syllabus. 90.0 – 100 = A 80.0 – 89.9 = B
70.0 – 79.9 = C 60.0 – 69.9 = D

- If you missed 1 lab, you need to come to the Alternate Lab and do Exp. 21. This experiment will substitute for the missing quiz and report. (You are still responsible for the missed material on the Final Exam.)
- ***If you missed more than 1 experiment, the deadline*** for submitting documentation to your instructor (Dr. Allen or Dr. Kolniak) **is Apr. 20 or 21.** If your absence is excused, your averages will be calculated with one less experiment.
If no documentation is provided or it is deemed unexcused, then these scores will remain zero in the calculation of your quiz and report averages.