

Preview Sheet for Test 3

Chapters 8, 9, 10 and 11

Lectures from 3/6 through 3/31; Problem Sets 6 and 7

The test will be on Thursday, April 6, in Olin-Rice **150**, starting at 8:30 a.m. You will have **3 hours** to work on the exam.

Studying Strategies:

- Focus on your lecture notes and homework first, then look at your textbook. (See the course web page for class overheads and homework keys.)
- Do extra problems at the ends of the chapters.
- It is important to understand concepts from lecture not covered explicitly in the homework problems. These will be covered by short answer and essay questions.
- If a topic was not covered in homework or in lecture, you are not responsible for it!

Preview of (Selected) Test Instructions:

- You should always justify your answers in writing, including the written use of the quadratic formula, unless you are explicitly told not to do so. You will be awarded credit only for clear, legible work.
- You may always assume all activity coefficients are 1 unless you are explicitly told otherwise in a problem statement.
- You may always use Harris' shortcuts for computing equilibrium concentrations unless you are explicitly told otherwise in a problem statement.

Note the formulas and constants you will be given on the exam:

$$\mu = \frac{1}{2} \sum_i C_i z_i^2 \quad A_i = [i] \gamma_i \quad \log \gamma_i = \frac{-0.51 z_i^2 \sqrt{\mu}}{1 + \frac{\alpha_i \sqrt{\mu}}{305}}$$

$$K_w = [\text{H}^+][\text{OH}^-] = K_a K_b = K_1 K_{b2} = K_2 K_{b1} = 1.0 \times 10^{-14} \quad \text{p}K_w = \text{pH} + \text{pOH} = 14.00$$

$$\text{pH} = \text{p}K_a + \log \frac{[\text{A}^-]}{[\text{HA}]} \quad [\text{H}^+] = \sqrt{\frac{K_1 K_2 [\text{HA}^-] + K_1 K_w}{K_1 + [\text{HA}^-]}}$$

$$N_A = 6.022 \times 10^{23} \text{ particle mol}^{-1} \quad 1 \text{ L} = 1000 \text{ mL} = 1000 \text{ cm}^3$$

$$1 \text{ ppm} = 1 \text{ in } 10^6 \quad 1 \text{ ppb} = 1 \text{ in } 10^9 \quad 1 \text{ ppt} = 1 \text{ in } 10^{12}$$