

CHEM 121
Quiz 8

Name _____
Due in Class March 30, 2009

Complete the following problems. Clearly justify any assumptions made. Work must be shown to earn partial credit for each problem. You may use your book and notes, but you may not seek help from anyone other than Dr. Lamp. Failure to abide by this rule will result in a zero for the quiz and the Dean of Students office will be notified. This signed sheet **must** accompany your quiz. If you have a solid understanding of the approach, you should be able to complete these problems in 20 minutes or less without your book and notes.

I affirm that the work submitted is my own and that I received help from no one other than Dr. Lamp. I realize that failure to follow the rules above will result in a zero for the quiz and will be reported as an act of academic dishonesty.

Signature

Date

1. Sodium benzoate, which can be prepared by neutralizing benzoic acid ($K_a = 6.3 \times 10^{-5}$) with sodium hydroxide, is used as a preservative in foods. Calculate the pH of a 0.0100 M solution of sodium benzoate. (8 pts)

2. Calculate the equilibrium concentrations of all species present and the pH of a 0.15 M solution of sulfurous acid (H_2SO_3 , $\text{pK}_{\text{a}1} = 1.82$, $\text{pK}_{\text{a}2} = 7.00$)? (8 pts)
3. A newly discovered monoprotic weak acid, Trumanic Acid, has been found to have a K_{a} of 1.58×10^{-6} . Calculate the pH of the solution prepared by mixing 21.5 mL of 0.104 M NaOH with 30.0 mL of 0.116 M Trumanic acid (you may assume a total solution volume of 51.5 mL). (9 pts)