

NAME _____

last

first

EXAM V

Significant Figures must be correct. All set-ups must be shown

(34 points) **1.** Calculate the pH of the following:

a. 0.250 M Cyanic acid HOCN ($K_a = 3.5 \times 10^{-4}$)

ANSWER _____

b. 0.500 M NaF ($K_a \text{ HF} = 6.8 \times 10^{-4}$)

ANSWER _____

c. 5.30 g NaHCO_3 dissolved in 100.0 mL of 1.00 M H_2CO_3 ($K_{a1} = 4.3 \times 10^{-7}$, $K_{a2} = 4.8 \times 10^{-11}$)

ANSWER_____

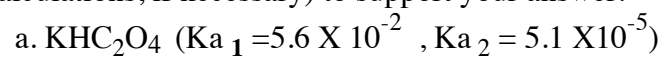
d. 0.500 M NaHSO_3 ($K_{a1} = 1.3 \times 10^{-2}$, $K_{a2} = 6.3 \times 10^{-8}$)

ANSWER_____

1. (10 points) A solution contains .787 M KI and 2.82 M KCl. Solid AgNO_3 is slowly added to the solution. Which will precipitate first, AgI or AgCl? (K_{sp} of AgI = 1.8×10^{-17} AgCl = 1.8×10^{-10})

ANSWER _____

(12 points) 3. Will the following solutions be acidic, basic or neutral? Write the equilibrium equations (and calculations, if necessary) to support your answer.



(15 points) 4. Calculate the pH of the resulting solution when 100.00 mL of 0.500M HNO₂ is added to 50.00 mL of 3.00 M NaOH (K_a HNO₂ = 4.5 X10⁻⁴)

ANSWER_____

(15 points) 6. What is the solubility of ZnS in a solution that is saturated with H₂S (0.100M) If the pH = 3.50 (K_{a1} = 8.9 X 10⁻⁸ K_{a2} = 1.2 X 10⁻¹³)

ANSWER_____

(18 points) 7. How many moles of NaOH should be added to 100.0 mL of 0.200 M Benzoic Acid (HC₇H₅O₂) to produce a solution with a pH = 6.50?(K_a Benzoic acid =6.3 X10⁻⁵)

ANSWER_____