

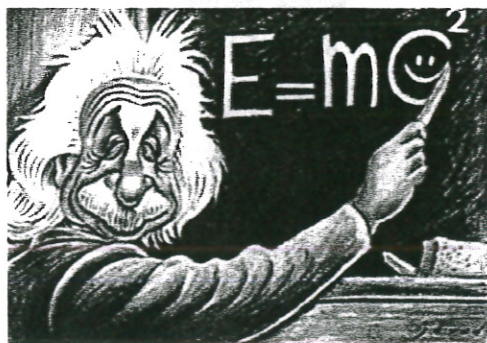
Extra ch 17

II. Free-Response Questions:

You are to do question #1 and then choose one from the other 3. These are worth 30 pts each. The two questions you do not choose take home and do as an open note quiz. These are worth 20 pts each.

1. Hypochlorous acid (HOCl) is a weak acid commonly used as bleaching agent. The acid-dissociation constant (K_a) = 3.2×10^{-8} .

- A) (5 pts) Calculate the $[H^+]$ in a 0.14M HOCl solution.
- B) (5 pts) Calculate the pH at the halfway point of standardization between HOCl the soluble ionic salt sodium hypochlorite (NaOCl).
- C) (5 pts) Write out a net-ionic equation for the reaction between the weak acid HOCl and the addition of the soluble ionic salt NaOCl.
- D) (5 pts) Calculate the K_b value for the conjugate base hypochlorite (OCl^-).
- D) (10 pts) Calculate the pH at the equivalence point when 40.0 mL of a 0.50M HOCl solution is titrated with 0.60M CsOH solution.



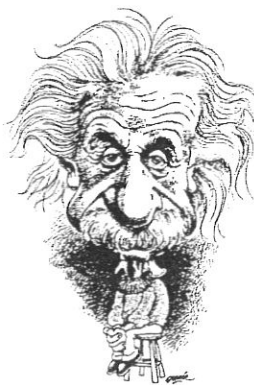
You must do this question.....

**And remember...collect data...Analyze data....Evaluate data....and solve !!!

Don't think to deep !

Choose one of the next three:

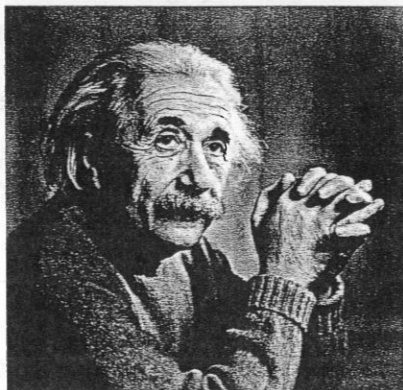
2. The solubility of copper (II) Hydroxide , Cu(OH)_2 , is 1.72×10^{-6} grams per 100.0 mL of solution at 25C. (Solute molar mass = 97.5).
- A) (5 pts) Write out the equation representing the equilibrium of this metallic hydroxide in water.
 - B) (5 pts) Write out the equilibrium expression
 - C) (5 pts) Calculate the Molar Solubility of copper (II) hydroxide in water.
 - D) (5 pts) Calculate the K_{sp} value for this slightly soluble metallic hydroxide.
 - E) (5pts) Calculate the pH of the solution.
 - F) (5 pts) What would happen to the pH is an acid were added? Explain in terms of LeChatelier's Principle.



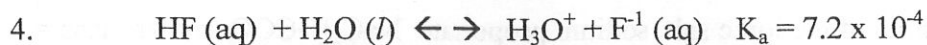
Don't over think.....

3. A 0.496 gram sample of the ionic salt, sodium propanoate $\text{NaC}_2\text{H}_5\text{COO}$ (molar mass = 96) is added to 50.0 mL of 0.265M solution of propanoic acid $\text{C}_2\text{H}_5\text{COOH}$. When the two are mixed. Assume no change in volume. K_a (propanoic acid) = 1.334×10^{-5}

- A) (5 pts) What is the concentration of the ionic salt in solution.
- B) (5 pts) Write out the equation for this equilibrium system.
- C) (5 pts) What is the hydronium ion concentration?
- D) (5 pts) What is the pH of this solution?
- E) (5 pts) Could this be considered a "buffer"? Explain why or why not.
- F) (5 pts) Explain how this system would react if a strong base were added.



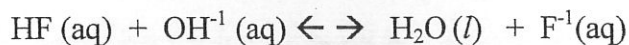
I am so proud of all you*AE*



Hydrofluoric acid HF (aq), dissociates in water as represented by the above equation.

- A) (5 pts) Write out an equilibrium-constant expression for the dissociation of this acid in water.
- B) (5 pts) Calculate the molar concentration of hydronium ions in a 0.40M HF (aq) solution.
- C) (5 pts) What is the pH and pOH of this solution?

In another reaction HF reacts with NaOH according to the following equation:



A volume of 15.0 mL of 0.40M NaOH (aq) is added to 25.0 mL of 0.40M HF (aq). Assume the volumes are additive.

- D) (5 pts) Calculate the excess moles of HF remaining in the solution.
- E) (5 pts) What is the molar concentration of F^- in the combined solution.
- F) (5 pts) What is the pH of the solution?



Wishing you a wonderful break !!!!!