****SHOW ALL WORK TO RECEIVE CREDIT****

1. (7 Pts) Benzoic acid (HC₇H₅O₂) has a K_a of 6.3 x 10⁻⁵. Determine the pH of 300.0 mL of a 0.070 M benzoic acid solution. You must first write the chemical equation for the process involved.

HC₇H₅O₃ + H₂O
$$\Rightarrow$$
 C₇H₅O₃ + H₃O † Ka = $\frac{[C_7H_5O_5][H_2O^{\dagger}]}{[HC_7H_5O_2]}$
I. 0.070 NA +× +× +× +× +× 6.3×10⁻⁵ $\frac{X^2}{0.070-X}$ + $\frac{T_7}{5\%}$ rule
$$X = [H_3O^{\dagger}] = 0.0021$$

$$PH = 2.68$$

2. (4 Pts) Determine the $[H_3O^+]$, the pH, $[OH^-]$, and the pOH of 85.0 mL of a 0.015 M barium hydroxide solution.

$$Ba(OH)_{2}(s) \frac{H_{2}O}{Striny BASO} Ba^{2+} + 20H$$

 $[OH) = 2 \times 0.015 = [0.030]$
 $[POH = 1.52]$ $[H_{3}O^{+}] = 10^{-12.48} = 3.3 \times 10^{-13}$

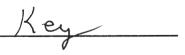
3. (7 Pts) Hydrazine, N_2H_4 , is a weak base with a K_b of 1.7 x 10^{-6} . Determine the pH of a 0.060 M solution of hydrazine. You must first write the chemical equation for the process involved.

Volumest first write the chemical equation for the process involved.

$$N_2 H_4 + H_2 0 \rightleftharpoons N_2 H_5^+ + OH^ V_2 H_4 + H_2 0 \rightleftharpoons N_2 H_5^+ + OH^ V_3 H_4 + V_4 + V_5 + V_6 + V_6$$

4. (7 Pts) A 0.050 M solution of a weak acid has a pH of 4.25. Determine the Ka of the weak acid. You must first write

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1. (7 Pts) Hydrazine, N_2H_4 , is a weak base with a K_b of 1.7 x 10^{-6} . Determine the pH of a 0.080 M solution of hydrazine.

You must first write the chemical equation for the process involved.

$$N_2H_4 + H_2O = N_2H_5 + OH$$
 $N_2H_4 + H_2O = N_2H_5 + OH$
 $N_3H_4 + H_2O = N_2H_5 + OH$
 $N_3H_4 + H_2O = N_2H_5 + OH$
 $N_3H_4 + H_2O = N_2H_5 + OH$
 $N_2H_4 + N_2O = N_2H_$

2. (4 Pts) Determine the $[H_3O^+]$, the pH, $[OH^-]$, and the pOH of 95.0 mL of a 0.035 M barium hydroxide solution.

$$B_{a}(0H) = \frac{H_{2}0}{S1rrn_{3}B_{A}c} B_{a}^{2+} + 20H$$

$$[OHJ = 2 \times 0.037 = [0.070]$$

$$[POH = 1.15]$$

$$[PH = 12.84]$$

$$[H_{2}0J = 10^{-12.84} = 1.43 \times 10^{-13}]$$

3. (7 Pts) Benzoic acid (HC₇H₅O₂) has a K_a of 6.3 x 10⁻⁵. Determine the pH of 700.0 mL of a 0.060 M benzoic acid solution. You must first write the chemical equation for the process involved.

You must first write the chemical equation for the process involved.

$$H C_7 H_5 O_3 + H_2 O \rightleftharpoons C_7 H_5 O_3 + H_3 O^{\dagger} \qquad K_0 = \frac{\left[C_7 H_5 O_3\right] \left[H_3 O^{\dagger}\right]}{\left[H C_7 H_5 O_3\right]}$$

$$T. \quad 0.060 \qquad NA \qquad O \qquad +X \qquad +X \qquad +X \qquad +X \qquad C. \qquad X \qquad X \qquad 6.3 \times 10^{-5} = \frac{X^2}{0.060 - X} = \frac{770}{0.060 - X} = \frac{770}{0.060$$

$$K_{a} = \frac{[H_{3} \circ + J[A]]}{[HA]}$$

$$K_{a} = \frac{(1.78 \times 10^{-5})^{2}}{(0.070 - 1.78 \times 10^{-5})}$$

$$(K_{a} = 4.52 \times 10^{-9})$$