

Name Key (print) Name _____ (sign)

Please show all work for full credit & to get partial credit. (suggestion: A guess is better than no answer.)
 $pH + pOH = 14$ $[H_3O^+][OH^-] = 1.0 \times 10^{-14} = K_w$ $p(\text{anything}) = -\log(\text{anything})$

1. Circle the Weak Acid among the following: (5 pts)

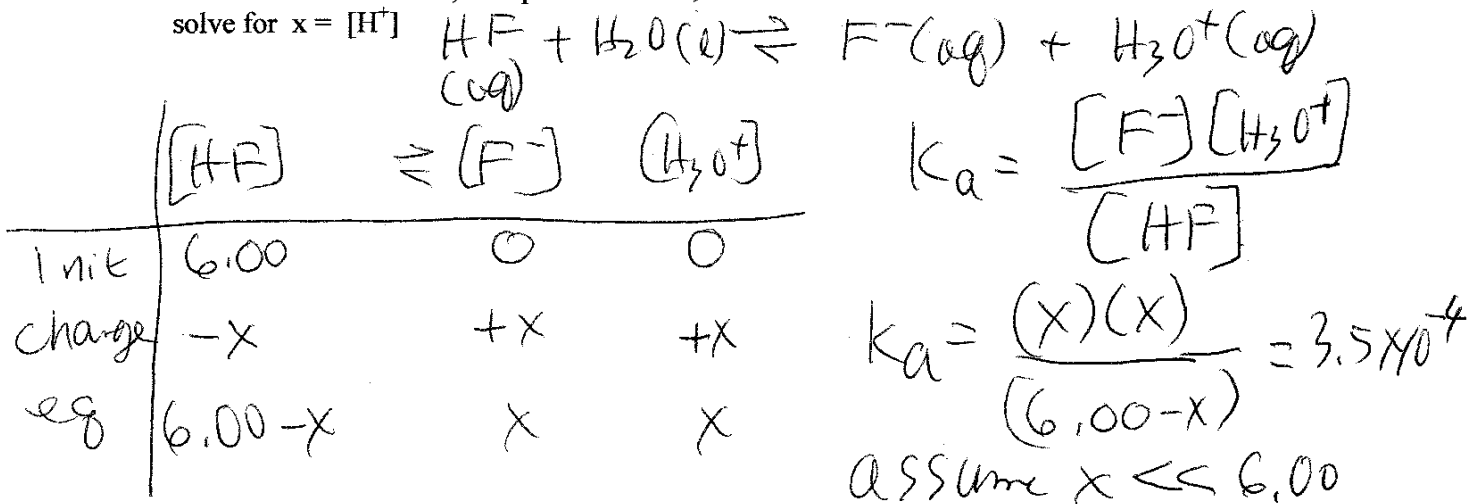


2. What is the pH of a strong acid with a concentration of 0.010 M? Please show work. (4 pts)

$$pH = -\log(0.010) \rightarrow pH = -(-2.00) \quad pH = +2.00$$

$$pH = -\log[H_3O^+]$$

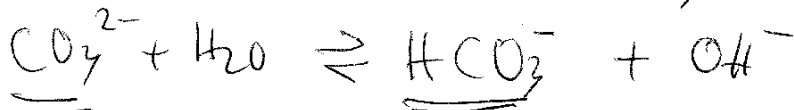
3. (7 pts) What is the $[H^+]$ at equilibrium of 6.00 M of HF dissolved in water? The K_a of HF is 3.5×10^{-4} . To do this, set up an ICE table, assume that the x is much smaller than 6.00 M and solve for $x = [H^+]$



$$\frac{(x)(x)}{(6.00)} = 3.5 \times 10^{-4} \rightarrow x^2 = (3.5 \times 10^{-4})(6.00) \rightarrow$$

$$x = \sqrt{(3.5 \times 10^{-4})(6.00)} \rightarrow x = 0.046$$

4. (4 pts) For CO_3^{2-} the conjugate acid is HCO_3^-

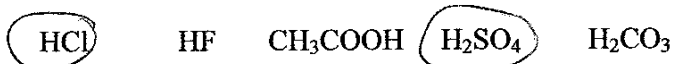


Extra Credit (4 pts) To make a buffer you would mix NH_3 with NH_4^+ Cl^-
 salt of weak base

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 $pH + pOH = 14$ $[H_3O^+][OH^-] = 1.0 \times 10^{-14} = K_w$ $p(\text{anything}) = -\log(\text{anything})$

1. Circle the Strong Acid among the following: (5 pts)



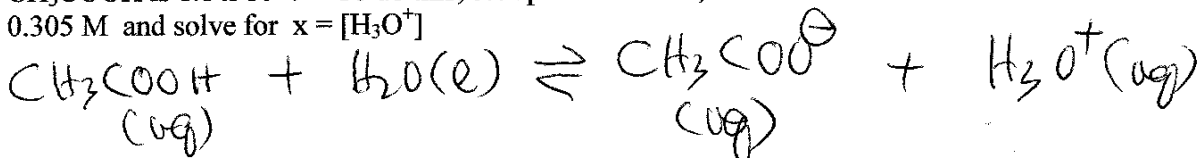
strong acids dissociate completely

2. What is the pH of a strong acid with a concentration of 0.250 M? Please show work. (4 pts)

$$pH = -\log[H_3O^+] = -\log[H^+] \quad pH = -\log(0.250)$$

$$pH = -(-0.602) \rightarrow pH = +0.602$$

3. (7 pts) What is the [H₃O⁺] at equilibrium of 0.305 M of CH₃COOH dissolved in water? The K_a of CH₃COOH is 1.8 x 10⁻⁵. To do this, set up an ICE table, assume that the x is much smaller than 0.305 M and solve for x = [H₃O⁺]



	[CH ₃ COOH]	[CH ₃ COO ⁻]	[H ₃ O ⁺]
init	0.305	0	0
change	-x	+x	+x
eq	0.305 - x	x	x

$$K_a = \frac{[CH_3COO^-][H_3O^+]}{[CH_3COOH]} = 1.8 \times 10^{-5} \rightarrow \frac{(x)(x)}{(0.305 - x)} = 1.8 \times 10^{-5}$$

$$\frac{x^2}{0.305 - x} = 1.8 \times 10^{-5} \quad \text{assume } x \ll 0.305 \rightarrow \frac{x^2}{0.305} = 1.8 \times 10^{-5}$$

$$x^2 = (1.8 \times 10^{-5})(0.305) \rightarrow x = \sqrt{(1.8 \times 10^{-5})(0.305)}$$

$$x = 2.34 \times 10^{-3}$$

4. (4 pts) For HCl the conjugate base is Cl⁻



acid base conj base conj acid

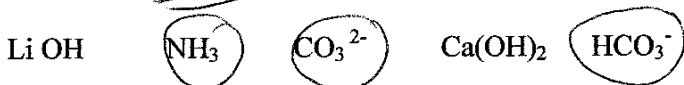
Extra Credit (4 pts) To make a buffer you would mix CH₃COOH with Na⁺ CH₃COO⁻
 salt of conj. base

Name Key (print) Name _____ (sign)

Please show all work for full credit & to get partial credit. (suggestion: A guess is better than no answer.)

$pH + pOH = 14$ $[H_3O^+][OH^-] = 1.0 \times 10^{-14} = K_w$ $p(\text{anything}) = -\log(\text{anything})$

1. Circle the Weak Base among the following: (5 pts)



2. What is the pH of a strong acid with a concentration of 0.100 M? Please show work. (4 pts)

$[H_3O^+] = [H^+] = 0.100 M$ $pH = -\log[H^+]$

$pH = -\log(0.100)$ $pH = -(-1) = +1$

3. (7 pts) If the K_a of $H_2C_2H_3O_2$ is 1.8×10^{-5} , find the $[H_3O^+]$ concentration at equilibrium. The initial concentration of $H_2C_2H_3O_2$ is 0.50 M. To do this, set up an ICE table, assume that the x is much smaller than 0.50 M and solve for $x = [H_3O^+]$

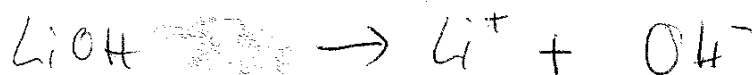
	$H_2C_2H_3O_2(aq)$	$H_3O^+(aq)$	$C_2H_3O_2^-(aq)$
init	0.50	0	0
change	-x	+x	+x
eq	0.50-x	x	x

$K_a = \frac{[H_3O^+][C_2H_3O_2^-]}{[H_2C_2H_3O_2]} = 1.8 \times 10^{-5}$

$\frac{(x)(x)}{(0.50-x)} = 1.8 \times 10^{-5}$ assume $x \ll 0.50$ $\frac{x^2}{(0.50)} = 1.8 \times 10^{-5}$

$x^2 = (1.8 \times 10^{-5})(0.50) \rightarrow x = \sqrt{(1.8 \times 10^{-5})(0.50)} = 3.0 \times 10^{-3}$

4. (4 pts) For Li OH the conjugate acid is Li⁺

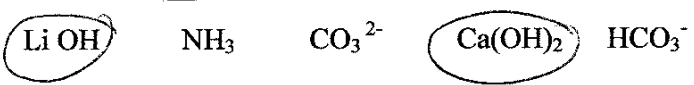


Extra Credit (4 pts) To make a buffer you would mix $Na_2CO_3^-$ with $NaHCO_3$

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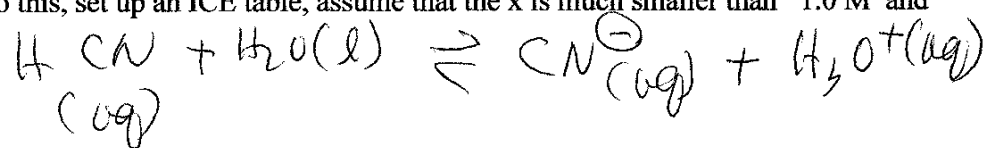
1. Circle the Strong Base among the following: (5 pts)



2. What is the pH of a strong acid with a concentration of 0.020 M? Please show work. (4 pts)

$pH = -\log[H_3O^+] \rightarrow pH = -\log(0.020)$
 $pH = -(-1.698) \rightarrow pH = +1.70$

3. (7 pts) If the K_a of HCN is 4.9×10^{-10} , find the $[H^+]$ at equilibrium if the initial concentration of HCN is 1.0 M. To do this, set up an ICE table, assume that the x is much smaller than 1.0 M and solve for $x = [H^+]$



	HCN	\rightleftharpoons	CN^-		H_3O^+
init	1.0		0		0
change	-x		+x		+x
eq	1.0-x		x		x

$K_a = \frac{[CN^-][H_3O^+]}{[HCN]}$

$\frac{(x)(x)}{(1.0-x)} = 4.9 \times 10^{-10} \rightarrow \frac{x^2}{1.0-x} = 4.9 \times 10^{-10}$
 $x \ll 1.0 \rightarrow \frac{x^2}{1.0} = 4.9 \times 10^{-10} \rightarrow x^2 = (4.9 \times 10^{-10})(1.0)$
 $x = \sqrt{(4.9 \times 10^{-10})(1.0)} \rightarrow x = 2.2 \times 10^{-5}$

4. (4 pts) For CH_3COOH the conjugate base is CH_3COO^-

Extra Credit (4 pts) To make a buffer you would mix HCN with Na CN

Quiz V General Chemistry II Lecture Dr. Hahn 20 pts 3/27/13 W form A 9:30 am quiz # 69

Name _____ (print) Name _____ (sign)

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$\text{pH} + \text{pOH} = 14$ $[\text{H}_3\text{O}^+][\text{OH}^-] = 1.0 \times 10^{-14} = K_w$ $\text{p}(\text{anything}) = -\log(\text{anything})$

1. Circle the Strong Acid among the following: (5 pts)

HCl HF CH₃COOH H₂SO₄ H₂CO₃

2. What is the pH of a strong acid with a concentration of 0.250 M? Please show work. (4 pts)

3. (7 pts) What is the $[\text{H}_3\text{O}^+]$ at equilibrium of 0.305 M of CH₃COOH dissolved in water? The K_a of CH₃COOH is 1.8×10^{-5} . To do this, set up an ICE table, assume that the x is much smaller than 0.305 M and solve for $x = [\text{H}_3\text{O}^+]$

4. (4 pts) For HCl the conjugate base is _____

Extra Credit (4 pts) To make a buffer you would mix CH₃COOH with Na _____

Name _____ (print) Name _____ (sign)

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1. Circle the Weak Acid among the following: (5 pts)

HCl HF CH₃COOH H₂SO₄ H₂CO₃

2. What is the pH of a strong acid with a concentration of 0.010 M? Please show work. (4 pts)

3. (7 pts) What is the $[\text{H}^+]$ at equilibrium of 6.00 M of HF dissolved in water? The K_a of HF is 3.5×10^{-4} . To do this, set up an ICE table, assume that the x is much smaller than 6.00 M and solve for $x = [\text{H}^+]$

4. (4 pts) For CO_3^{2-} the conjugate acid is _____

Extra Credit (4 pts) To make a buffer you would mix NH_3 with _____ Cl

Name _____ (print) Name _____ (sign)

Please show all work for full credit & to get partial credit. (suggestion: A guess is better than no answer.)
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1. Circle the Strong Base among the following: (5 pts)

Li OH NH_3 CO_3^{2-} $\text{Ca}(\text{OH})_2$ HCO_3^-

2. What is the pH of a strong acid with a concentration of 0.020 M? Please show work. (4 pts)

3. (7 pts) If the K_a of H CN is 4.9×10^{-10} , find the $[\text{H}^+]$ at equilibrium if the initial concentration of H CN is 1.0 M. To do this, set up an ICE table, assume that the x is much smaller than 1.0 M and solve for $x = [\text{H}^+]$

4. (4 pts) For CH_3COOH the conjugate base is _____

Extra Credit (4 pts) To make a buffer you would mix H CN with Na _____

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1. Circle the Weak Base among the following: (5 pts)

Li OH NH_3 CO_3^{2-} $\text{Ca}(\text{OH})_2$ HCO_3^-

2. What is the pH of a strong acid with a concentration of 0.100 M? Please show work. (4 pts)

3. (7 pts) If the K_a of $\text{H C}_2\text{H}_3\text{O}_2$ is 1.8×10^{-5} , find the $[\text{H}_3\text{O}^+]$ concentration at equilibrium. The initial concentration of $\text{H C}_2\text{H}_3\text{O}_2$ is 0.50 M. To do this, set up an ICE table, assume that the x is much smaller than 0.50 M and solve for $x = [\text{H}_3\text{O}^+]$

4. (4 pts) For Li OH the conjugate acid is _____

Extra Credit (4 pts) To make a buffer you would mix Na_2CO_3^- with Na _____