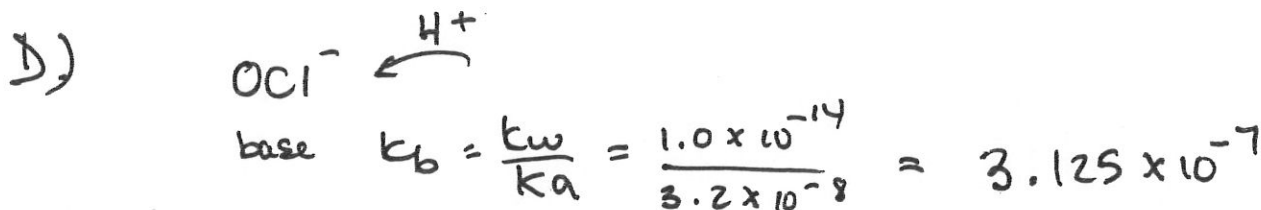
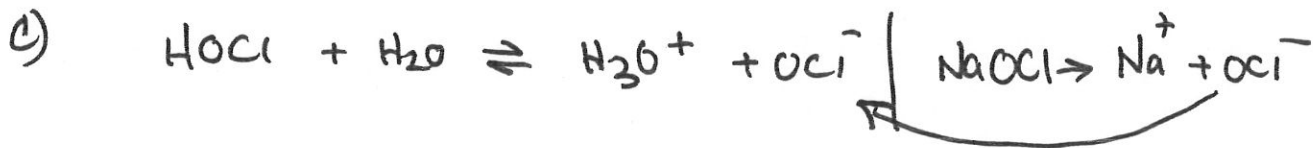
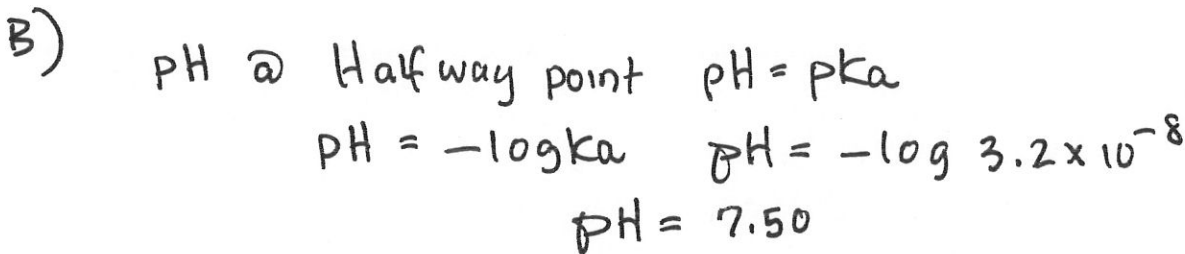
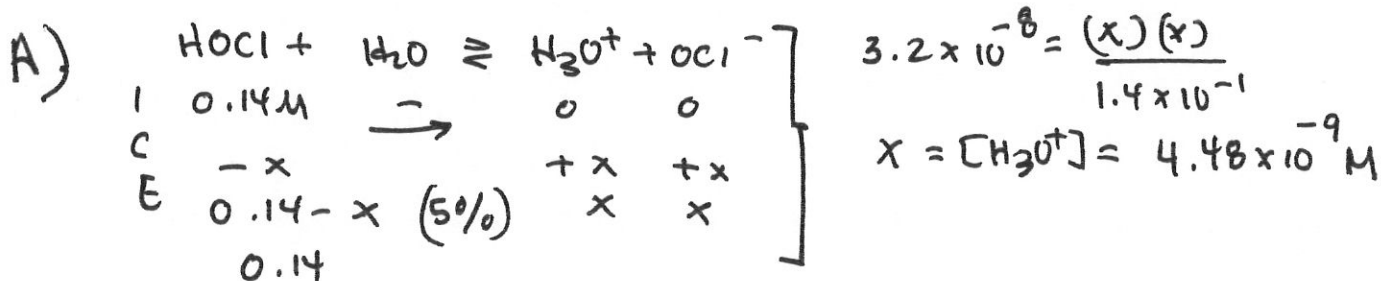
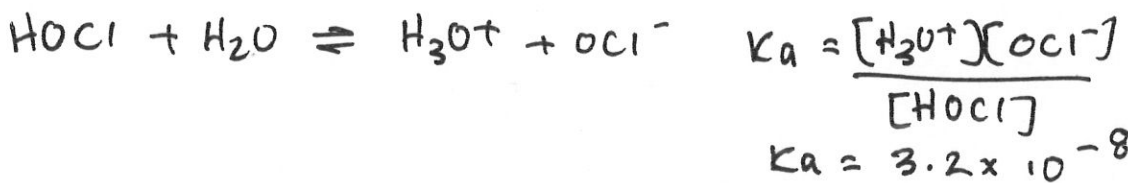


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1.



E)

	<u>HOCl</u>	<u><math>\text{OH}^-</math></u>		
	0.50 M	0.60 M		
	$\times 0.40 \text{ mL}$	$[0.33 \text{ L}]$		
equiv $\rightarrow$	$\frac{0.02 \text{ mol HOCl}}$	$\boxed{0.02 \text{ mol OH}^-}$		

$V_T = .40 + .33 = 0.73 \text{ L}$

$M = \frac{n}{L} \cdot 0.60 \text{ M} = \frac{0.02 \text{ mol}}{.73 \text{ L}}$

$K_b = \frac{K_w}{K_a} = \frac{[\text{OH}^-][\text{OCl}^-]}{[\text{HOCl}]}$

	$\text{HOCl}$	$+$	$\text{OH}^-$	$\rightarrow$	$\text{H}_2\text{O}$	$+$	$\text{OCl}^-$	Limiting / Excess
n <sub>i</sub>	.02 mol		.02 mol		0		0	moles
n <sub>f</sub>	0		0		0		.02 mol	

Hydrolysis

$\frac{0.02 \text{ mol}}{0.73 \text{ L}} = 0.027 \text{ M}$

	$\text{OCl}^-$	$+$	$\text{H}_2\text{O}$	$\rightleftharpoons$	$\text{HOCl}$	$+$	$\text{OH}^-$
I	0.027 M		0		0		0
C	-x				+x		+x
E	0.027 - x (5%)				x		x

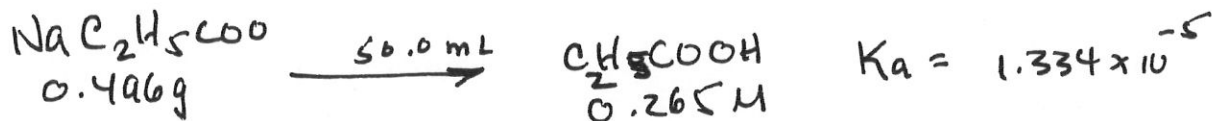
$3.125 \times 10^{-7} = \frac{(x)(x)}{2.7 \times 10^{-2}}$

$X = [\text{OH}^-] = 9.15 \times 10^{-5} \text{ M}$

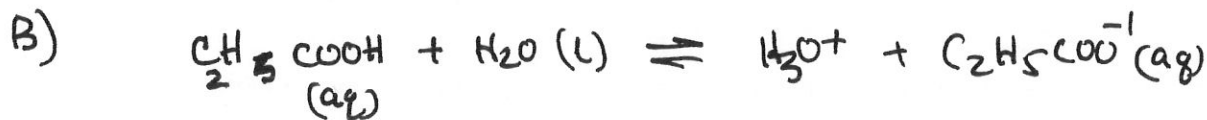
$\text{pOH} = 4.04$

$\text{pH} = 9.96$

3.



A)  $[\text{NaC}_2\text{H}_5\text{COO}] = \frac{0.496 \text{ g} / 46 \text{ g mol}^{-1}}{50 \text{ mL} / 1000 \text{ mL L}^{-1}} = 0.103 \text{ M}$



C)  $0.265 \text{ M} \qquad\qquad\qquad \times \qquad\qquad\qquad 0.103 \text{ M}$

$$K_a = \frac{[\text{H}_3\text{O}^+][\text{C}_2\text{H}_5\text{COO}^-]}{[\text{C}_2\text{H}_5\text{COOH}]}$$

$$1.334 \times 10^{-5} = \frac{(x)(0.103)}{(0.265)} \quad \text{pH} = -\log \text{H}^+$$

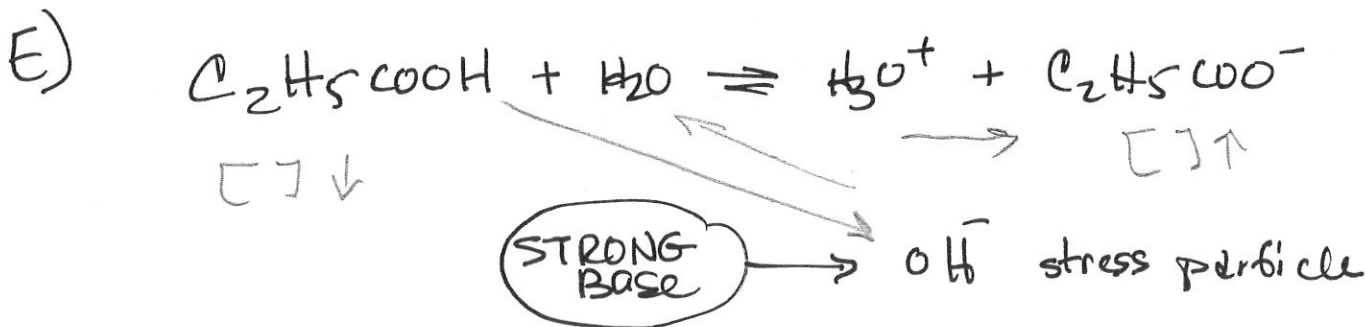
OR

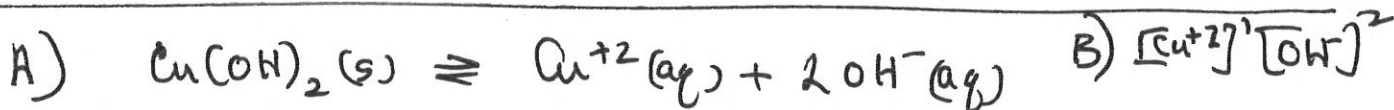
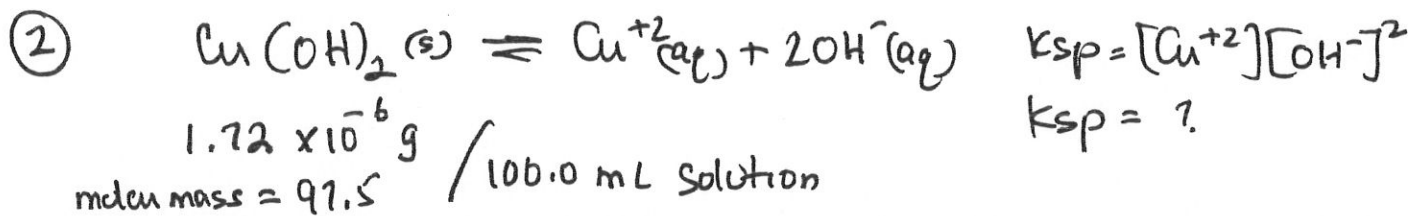
Buffer.  $\text{pH}_{\text{Buffer}} = -\log K_a + \log \frac{[\text{C}_2\text{H}_5\text{COO}^-]}{[\text{C}_2\text{H}_5\text{COOH}]}$

$$-\log 1.334 \times 10^{-5} + \log \frac{.103}{.265} \quad \text{pH} = 4.40$$

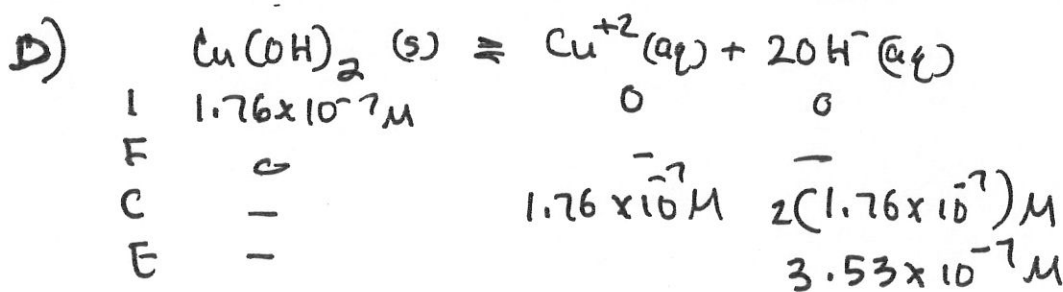
4.87 + -.47

D) Yes Weak Acid and it's Conj. base are present in solution.



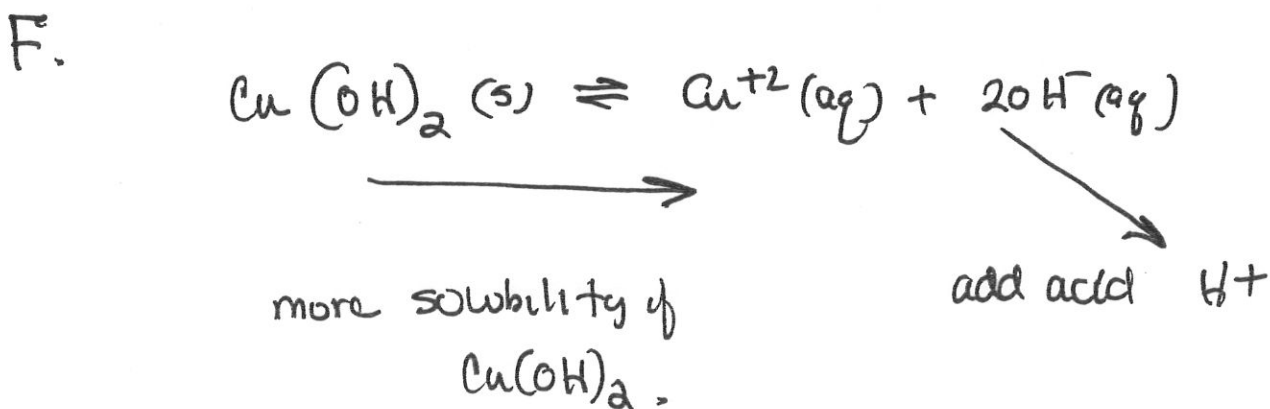


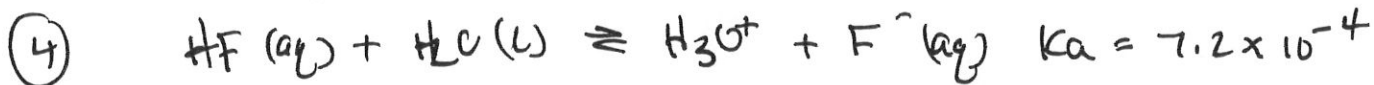
B)  $\frac{1.72 \times 10^{-6} \text{ g}}{97.5} \left| \frac{1 \text{ mol}}{97.5} \right. = \frac{1.76 \times 10^{-8} \text{ mol}}{0.100 \text{ L}} = 1.76 \times 10^{-7} \text{ M}$



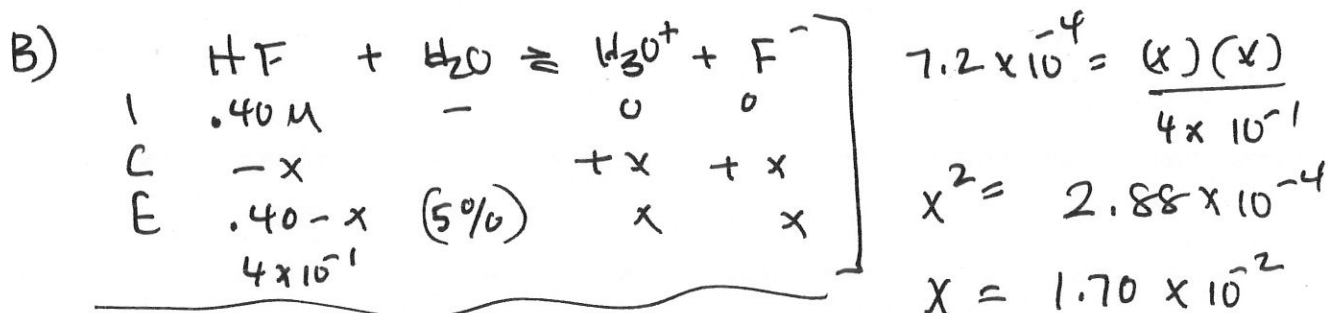
$K_{sp} = [\text{Cu}^{2+}][\text{OH}^-]^2 = (1.76 \times 10^{-7})(3.53 \times 10^{-7})^2$   
 $K_{sp} = 2.19 \times 10^{-20}$

E.  $[\text{OH}^-] = 3.53 \times 10^{-7} \text{ M}$   $\text{pOH} = -\log(3.53 \times 10^{-7})$   
 $\text{pOH} = 6.45$   
 $\text{pH} + \text{pOH} = 14$   $\text{pH} = 7.55$



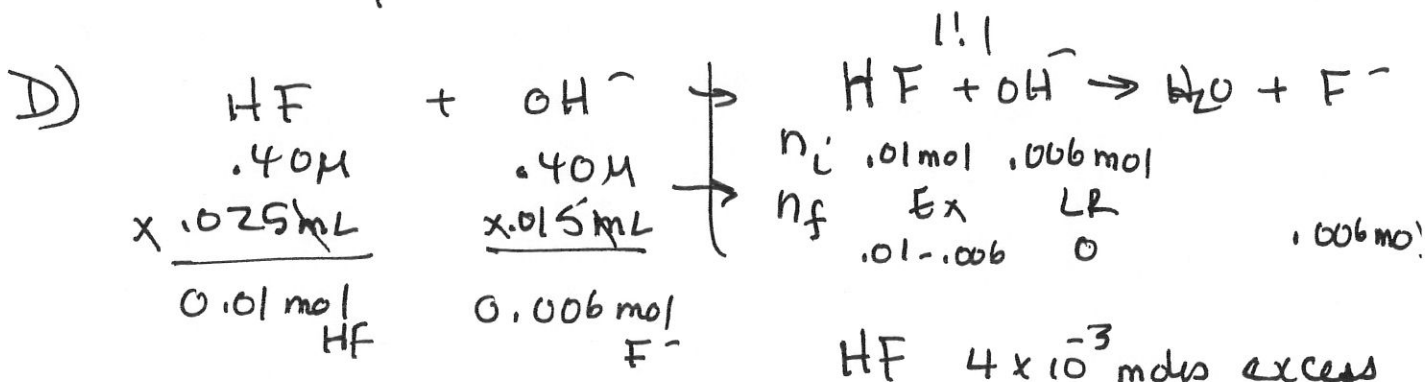


A) 
$$\frac{[\text{H}_3\text{O}^+][\text{F}^-]}{[\text{HF}]}$$

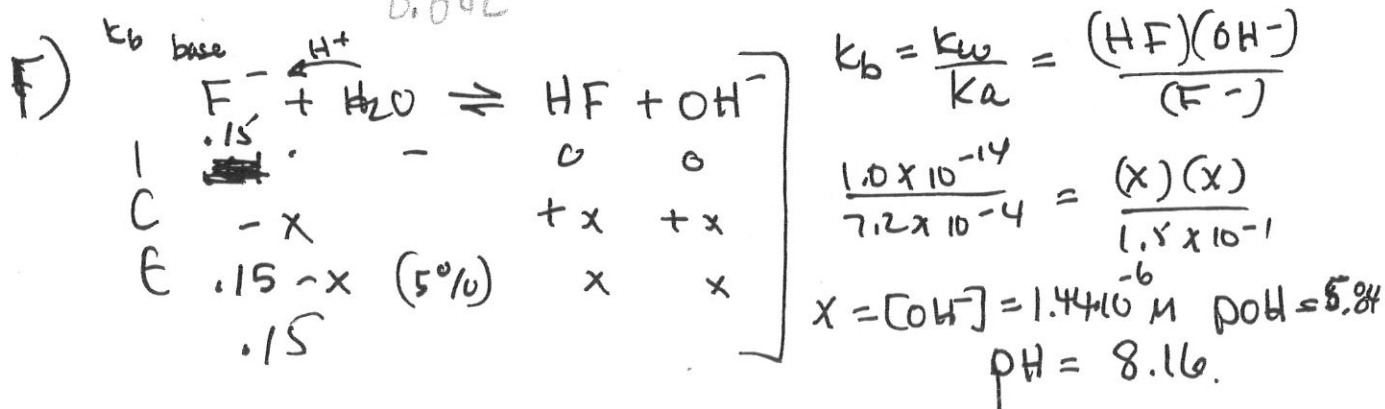


$\text{pH} = -\log [\text{H}^+] = -\log 1.70 \times 10^{-2}$   
 $\text{pH} = 1.77$   
 $\leftarrow [\text{H}_3\text{O}^+] = 1.70 \times 10^{-2} \text{ M}$

C)  $\text{pOH} + \text{pH} = 14$   
 $\text{pOH} = 12.23$



E) 
$$\text{F}^- \frac{.006 \text{ moles}}{(0.025 + 0.015) \text{ L}} = 0.15 \text{ M} = [\text{F}^-]$$



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1. b
2. c
3. d
4. d
5. b
6. c
7. c
8. e
9. a
10. b
11. b
12. c
13. b
14. b
15. a