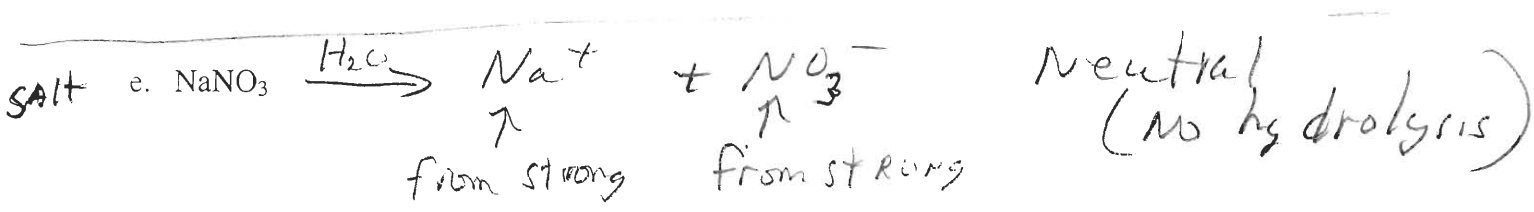
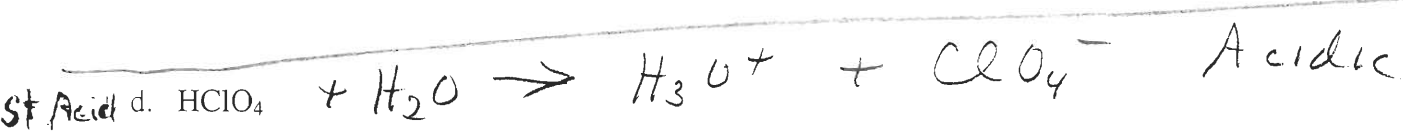
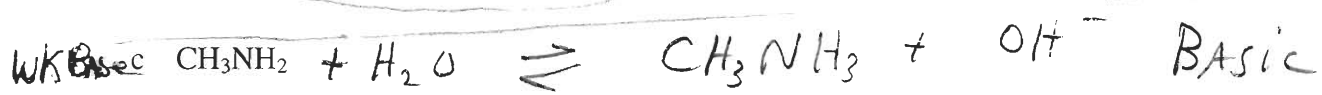
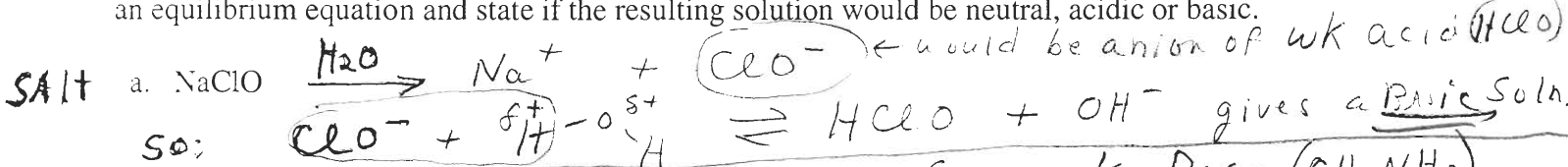


1. (10 Pts) Write an equation showing what happens when each of the following compounds is introduced into water. Then for each of the salts show any hydrolysis of the ions that would occur in an equilibrium equation and state if the resulting solution would be neutral, acidic or basic.



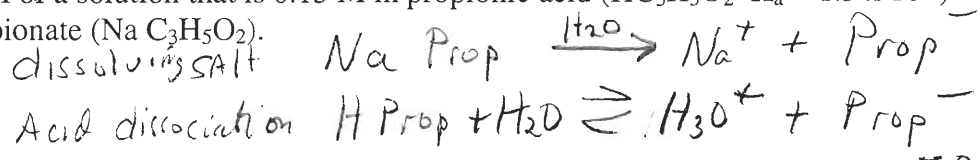
2. (5 Pts) Calculate the pH of a 0.20 M solution of KCN. ($K_a(\text{HCN}) = 4.9 \times 10^{-10}$)
 Dissolve salt in $\text{H}_2\text{O} = \text{KCN} \xrightarrow{\text{H}_2\text{O}} \text{K}^+ + \text{CN}^-$ undergoes hydrolysis

$K_b = K_w / K_a = 2.04 \times 10^{-5}$
 $2.04 \times 10^{-5} = \frac{x^2}{0.20 - x}$ (try dropping)
 $x = 0.0020 = [\text{OH}^-]$ $\text{pOH} = 2.69$
 $\text{pH} = 11.30$

	$\text{CN}^- + \text{H}_2\text{O} \rightleftharpoons \text{HCN} + \text{OH}^-$	
I.	0.20	0
C.	-x	+x
E.	0.20-x	x

3. (10 Pts) Calculate the pH of a solution that is 0.15 M in propionic acid ($\text{HC}_3\text{H}_5\text{O}_2$, $K_a = 1.3 \times 10^{-5}$) and 0.050 M in sodium propionate ($\text{NaC}_3\text{H}_5\text{O}_2$).

(Buffer system)



$K_a = \frac{[x][0.050 + x]}{0.15 - x}$ (try dropping)
 $x = 3.9 \times 10^{-5} = [\text{H}^+]$

I.	0.15	0	0.050
C.	-x	+x	+x
E.	0.15-x	+x	0.050+x

$\text{pH} = 4.41$