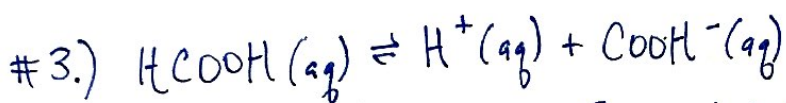
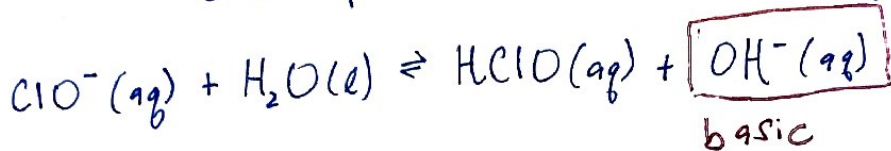


# AP Unit 7 Quiz Kahoot

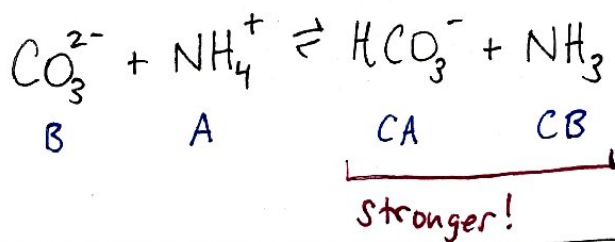
#1.)  $\text{LiClO} \rightarrow \text{Li}^+$  (parent  $\text{LiOH}$  = strong base, no hydrolysis)  
 $\rightarrow \text{ClO}^-$  (parent  $\text{HClO}$  = weak acid, yes hydrolysis)



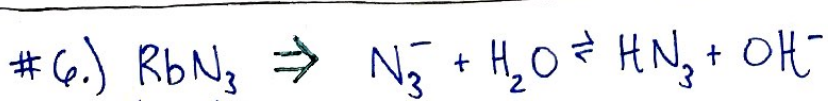
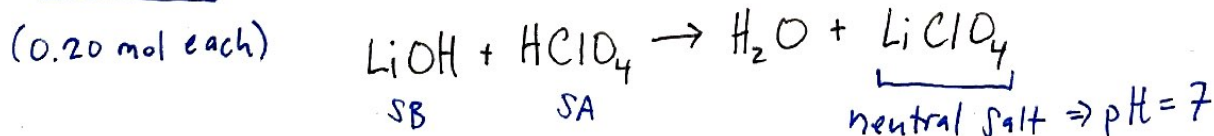
$\rightarrow$  What increases % ionization?  $\Rightarrow$  what shifts rxn right?

- X I. Adding  $\text{NaCOOH} \Rightarrow \uparrow [\text{COOH}^-]$ , shift left
- X II. Adding  $\text{HCl} \Rightarrow \uparrow [\text{H}^+]$ , shift left
- ✓ III. Increasing pH  $\Rightarrow \downarrow [\text{H}^+]$ , shift right
- X IV. Decreasing pH  $\Rightarrow \uparrow [\text{H}^+]$ , shift left

#4.)  $K < 1 \Rightarrow$  reactant-favored  $\Rightarrow$  reactants are weaker acid/base!



#5.) Equimolar strong base ( $\text{LiOH}$ ) + strong acid ( $\text{HClO}_4$ )  $\Rightarrow$  completely neutralize



$\text{RbOH}$                        $\text{HN}_3$   
 SB                      WA  
 0.40  
 $-x$   
0.40-x

$x$  negl.  $K_b = \frac{K_w}{K_a} = \frac{10^{-14}}{10^{-5}} = 10^{-9}$

$K_b = \frac{x^2}{0.4} = 10^{-9}$   
 $[\text{OH}^-] = x = \sqrt{(4E-1)(1E-9)}$   
 $= \sqrt{4E-10} = 2E-5$   
 $\Rightarrow \text{pOH} \approx 5 \Rightarrow \text{pH} = 14 - 5 = \boxed{9}$

#8.) Adding  $\text{NH}_3$  = adding base  $\Rightarrow$  neutralizes acid, so  
 more weak acid is able to ionize  $\Rightarrow \boxed{\text{HNO}_2}$   
 (not  $\text{HNO}_3$ : strong acid already 100% dissociated)

#9.)  $\text{pH} = 4 \Rightarrow [\text{H}^+] = 10^{-4} = x$

$$K_a = \frac{x^2}{[\text{HA}]_i} = \frac{(10^{-4})^2}{0.1} = \frac{10^{-8}}{10^{-1}} = \boxed{1 \times 10^{-7}}$$

#10.)  $\text{RbF} \rightarrow \text{Rb}^+ \Rightarrow \text{RbOH}$  (SB)  
 $\quad \quad \quad \downarrow \quad \quad \quad \downarrow$   
 $\quad \quad \quad \text{F}^- \Rightarrow \text{HF}$  (WA) } strong wins  $\Rightarrow$  basic salt  $\Rightarrow \text{pH} = 8.95$   
 (only basic choice)

#12.)  $K_a = \frac{x^2}{[\text{HA}]_i} = \frac{x^2}{0.1} = 1.8 \times 10^{-5} \Rightarrow x \approx \sqrt{(1 \times 10^{-1})(1.8 \times 10^{-5})} = \sqrt{1.8 \times 10^{-6}} = 1 \times 10^{-3} \text{ M}$   
 $\underbrace{1 \times 10^{-3}}_{[\text{H}^+]}$

$$\% \text{ Ionization} = \frac{[\text{H}^+]_{\text{eq}}}{[\text{HA}]_i} \times 100 = \frac{1 \times 10^{-3}}{0.1} \times 100 = \frac{(1 \times 10^{-3})}{(1 \times 10^{-1})} \times 10^2 = \boxed{1\%}$$

#14.)  $\text{NH}_4\text{Br} \Rightarrow \text{NH}_4^+ + \text{H}_2\text{O} \rightleftharpoons \text{H}_3\text{O}^+ + \text{NH}_3$

$\downarrow$   
 $\text{NH}_3$   
 WB

$\downarrow$   
 $\text{HBr}$   
 SA

$\underbrace{\hspace{1cm}}$   
 acidic! need  $K_a = \frac{K_w}{K_b} = \frac{1 \times 10^{-14}}{2 \times 10^{-5}} \approx \frac{10^{-14}}{10^{-5}} = 10^{-9}$

$$K_a = \frac{x^2}{[\text{HA}]_i} = \frac{x^2}{3 \times 10^{-4}} = 1 \times 10^{-9}$$

$$[\text{H}^+] = x = \sqrt{(3 \times 10^{-4})(1 \times 10^{-9})} \approx \sqrt{(1 \times 10^{-4})(1 \times 10^{-9})} = \sqrt{10^{-13}} = 10^{-6.5}$$

$$\text{pH} = -\log(10^{-6.5}) = \boxed{6.5}$$