

## AP Chemistry Daily Videos

### 8.3 Weak Acid and Base Equilibria

#### Video #1

1. Hydrocyanic acid, HCN, is a highly toxic acid found in Prussian blue pigments. What are the pH and % ionization of a  $1.55 \times 10^{-3} M$  solution of HCN?  $pK_a = 9.21$   
Did you make any errors doing this problem? If so, what were they?

2. Explain why percent ionization increases as molarity decreases (due to dilution) in terms of Le Châtelier's Principle.

#### Video #2

1. Did you make any errors doing this problem? If so, what were they?

Sodium cyanide, NaCN dissociates to form the sodium ion and the weak base,  $CN^-$ . The cyanide ion is the **conjugate base** of hydrocyanic acid, HCN. What are the pH and % ionization of a  $1.55 \times 10^{-2} M$  solution of NaCN?  $pK_a$  for HCN = 9.21

2. Did you make any errors doing this problem? If so, what were they?

A solution of fluoride ion,  $F^-$ , has a % ionization of  $8.12 \times 10^{-4} \%$  and  $pH = 8.271$ .

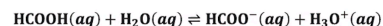
- Calculate the hydroxide ion concentration.
- Calculate the original molarity of fluoride ion,  $F^-$  in the solution.
- Determine the equilibrium constant,  $K_b$ , for  $F^-$ .

3. Write down the summarizing points you think are the most important.

### Video #3

1. What mental math tips were shared with you?

2. Did you make any errors doing this problem? If so, what were they?

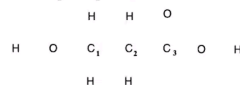


Formic acid reacts with water according to the equation above. Determine the approximate acid dissociation constant,  $K_a$ , if a 0.2 M solution has a 3 % ionization.

- $1 \times 10^{-4}$
- $2 \times 10^{-4}$
- $3 \times 10^{-2}$
- $2 \times 10^4$

3. Did you make any errors doing this problem? If so, what were they?

Answer the following questions regarding lactic acid.



- Complete the Lewis Dot structure for lactic acid. Show all bonding and non-bonding electrons.
- Identify the bond angle around carbon # 3.
- The  $pK_a$  for lactic acid is 3.86.
  - Calculate  $K_a$  for lactic acid.
  - Determine the pH for a 0.20 M solution of lactic acid.
- Would a 0.20 M solution of propanoic acid ( $K_a = 1.35 \times 10^{-5}$ ) be predicted to have pH that is lower than, equal to, or higher than the lactic acid solution. Justify your answer.