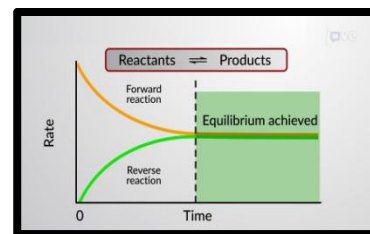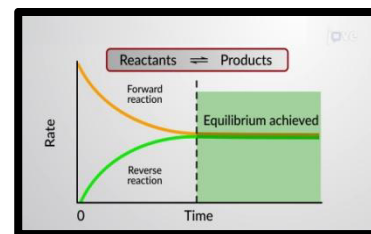**National Institute of Open Schooling**
Senior Secondary Course: Chemistry
Chapter- 12 (Ionic Equilibrium)
Worksheet-12

1. BF_3 does not have a proton but still acts as an acid and reacts with NH_3. Why it is so? What type of bond is formed between the two?

2. On the basis of the equation pH= - log $[H^+]$, the pH of 10^{-8} mol dm^{-3} solution of HCl should be 8. However, it is observed to be less than 7.0. Explain the reason.

3. The ionization constant of an acid, Ka, is the measure of the strength of an acid. The Ka values of acetic acid, hypochlorous acid and formic acid are 1.74×10^{-5}, 3.0×10^{-8} and 1.8×10^{-4} respectively. Which of the following orders of pH of 0.1 mol dm^{-3} solutions of these acids is correct?

   a)   acetic acid > hypochlorous acid > formic acid

   b)   hypochlorous acid > acetic acid > formic acid

   c)   formic acid > hypochlorous acid > acetic acid

   d)   formic acid > acetic acid > hypochlorous acid

4. A sparingly soluble salt having the general formula $A^{p+}_{x}B^{q-}_{y}$ and molar solubility S is in equilibrium with its saturated solution. Derive a relationship between the solubility and solubility product for such salt.

5. A crystal of common salt of a given mass is kept in an aqueous solution. After 12 hours, its mass remains the same. Is the crystal in equilibrium with the solution?

6. From the values of the equilibrium constants, indicate in which case, does the reaction go farthest to completion:

   $$K_1=10^{-10}, K_2=10^{10}, K_3=10^5$$

7. Following equilibrium is set up when SCN^- ion is added to Fe^{3+} in aqueous solution :

   a) Fe^{3+} (Pale yellow) + SCN^- (Colourless) $[Fe(SCN)]^{2+}$ (Deep red)

   b) When silver nitrate is added to the solution, AgSCN gets precipitate. What will happen to the equilibrium?

8. How will you account for the following:

National Institute of Open Schooling
Senior Secondary Course: Chemistry
Chapter- 12 (Ionic Equilibrium)
Worksheet-12

(a) Clothes dry quicker on a windy day

(b) We sweat more on a humid day?

9. The solubility of CO_2 in water decreases with an increase in temperature. Explain.

10. In a chemical reaction under equilibrium, there is no change in the molar concentration of products and reactants. Does the reaction stop?