**Self-Test on Tutorial 8**

**Check answers on page 1 of Tutorial 8 - Solutions**

1. Define the *solubility* of a substance (use the word *equilibrium* in your definition.)

   **Solubility** is the *equilibrium concentration* of a substance in a solution at a given temperature.

2. What two conditions are necessary to have a *saturated solution* of a substance?

   1. All of the solute that can be dissolved at a particular temperature is dissolved.
   2. There is undissolved solid present.
      
      Rate of dissolving = Rate of precipitation. Solubility equilibrium exists.

3. When a substance is first mixed with water, the *rate of dissolving* is fast and the *rate of precipitation* (or crystallization) is slow. As time goes on, the rate of precipitation gets faster and the rate of dissolving gets slower. When the *rate of dissolving* = the *rate of precipitation*, solubility equilibrium has been reached.

4. Give the *Net-Ionic Equation* which represents a *saturated solution* of each of the following ionic substances in water: (Hint: These are just like dissociation equations but they have a double arrow, indicating equilibrium.)

   a) \( \text{Ag}_2\text{SO}_4(s) \rightleftharpoons 2 \text{Ag}^{+}(aq) + \text{SO}_4^{2-}(aq) \)

   b) \( \text{FeS}(s) \rightleftharpoons \text{Fe}^{2+}(aq) + \text{S}^{2-}(aq) \)

   c) \( \text{Mg(OH)}_2(s) \rightleftharpoons \text{Mg}^{2+}(aq) + 2\text{OH}^{-}(aq) \)

   d) \( \text{Ca}_3(\text{PO}_4)_2(s) \rightleftharpoons 3\text{Ca}^{2+}(aq) + 2\text{PO}_4^{3-}(aq) \)
e) \[ \text{BaSO}_3(s) \rightleftharpoons \text{Ba}^{2+}(aq) + \text{SO}_3^{2-}(aq) \]

f) \[ (\text{NH}_4)_2\text{CrO}_4(s) \rightleftharpoons 2\text{NH}_4^+(aq) + \text{CrO}_4^{2-}(aq) \]

g) \[ \text{Fe(OH)}_3(s) \rightleftharpoons \text{Fe}^{3+}(aq) + 3\text{OH}^-(aq) \]

h) \[ \text{Al}_2(\text{SO}_4)_3(s) \rightleftharpoons 2\text{Al}^{3+}(aq) + 3\text{SO}_4^{2-}(aq) \]

*The End of Tutorial 8—Solutions*