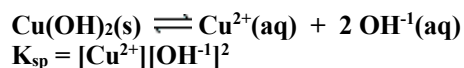


Answers**Question #1:** 10 points

- a. Write the balanced equation for the equilibrium of copper(II) hydroxide, $\text{Cu}(\text{OH})_2$, in water and the K_{sp} expression. $K_{\text{sp}} = 2.2 \times 10^{-20}$ at 25°C .



- b. What is the solubility of copper(II) hydroxide at 25°C ?

$$x = 1.8 \times 10^{-7} \text{ M}$$

- c. What is the solubility of copper(II) hydroxide at 25°C if the initial $[\text{Cu}^{+2}] = 0.010 \text{ M}$?

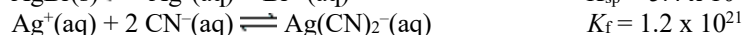
$$x = 7.5 \times 10^{-10} \text{ M } (7.4 \times 10^{-10} \text{ ok})$$

- d. Will a precipitate form when 10.0 mL of 0.0015 M copper(II) nitrate is mixed with 10. mL of 0.015 M sodium hydroxide?

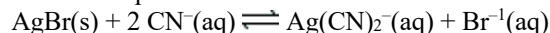
Yes, solid forms

Question #2: 4 points

Given the following reactions,



determine the equilibrium constant for the reaction below.



$$K_{\text{net}} = 6.5 \times 10^8$$

Question #3: 6 points

- a. A solution of Na_2SO_4 is added dropwise to a solution that is 0.010 M Ba^{2+} and 0.010 M Ag^{+1} . Neglecting volume changes, which salt precipitates first, BaSO_4 ($K_{\text{sp}} = 1.1 \times 10^{-10}$) or Ag_2SO_4 ($K_{\text{sp}} = 1.7 \times 10^{-5}$)?

BaSO_4 precipitates first

- b. What is the concentration of the cation that precipitates first when the second cation begins to precipitate?

$$6.5 \times 10^{-10} \text{ M}$$