Question #67625, Chemistry / General Chemistry - completed

Solid potassium hydroxide is slowly added to 75.0 mL of a 0.0412 M silver nitrate solution. The concentration of hydroxide ion required to just initiate precipitation is.

Solution:

$$AgNO_3 + KOH \rightarrow AgOH \downarrow + 2KNO_3$$

$$K_s = 1.28 * 10^{-8}$$

$$K_s = [Ag^+] * [OH^-] \Rightarrow [OH^-] = \frac{K_s}{[Ag^+]}$$

$$[Ag^+] = 75.0 * \frac{0.0412}{1000} = 0.00309$$

$$[OH^-] = \frac{1.28*10^{-8}}{3.09*10^{-3}} = 4.14 * 10^{-6} \text{ M.}$$

Answer: $4.14*10^{-6}$ M.