

Chapter 17 Worksheet

1. A 0.150 M Na_2SO_4 solution that is saturated with Ag_2SO_4 has $[\text{Ag}^+] = 9.7 \times 10^{-3}$ M. What is the value of K_{sp} for Ag_2SO_4 obtained with these data?
2. Will $\text{PbCl}_2(\text{s})$ precipitate when 155 mL of 0.016 M $\text{KCl}(\text{aq})$ are added to 245 mL of 0.175 M $\text{Pb}(\text{NO}_3)_2(\text{aq})$? $K_{\text{sp}} = 1.6 \times 10^{-5}$
3. What is the minimum pH at which $\text{Cd}(\text{OH})_2(\text{s})$ will precipitate from a solution that is 0.0055 M in $\text{Cd}^{2+}(\text{aq})$? $K_{\text{sp}} = 2.5 \times 10^{-14}$
4. When 200.0 mL of 0.350 M $\text{K}_2\text{CrO}_4(\text{aq})$ are added to 200.0 mL of 0.0100 M $\text{AgNO}_3(\text{aq})$, what percentage of the Ag^+ is left unprecipitated? K_{sp} for $\text{Ag}_2\text{CrO}_4 = 1.1 \times 10^{-12}$

5. A solution is 0.010 M in both CrO_4^{2-} and SO_4^{2-} . To this solution, 0.50 M $\text{Pb}(\text{NO}_3)_2(\text{aq})$ is slowly added. $K_{\text{sp}} \text{PbCrO}_4 = 2.8 \times 10^{-13}$ and $K_{\text{sp}} \text{PbSO}_4 = 1.6 \times 10^{-8}$

a. Which anion will precipitate first from solution?

b. What is $[\text{Pb}^{2+}]$ at the point at which the second anion begins to precipitate?

6. Should $\text{Mg}(\text{OH})_2(\text{s})$ precipitate from a solution that is 0.010 M MgCl_2 and also 0.10 M NH_3 ?
 $K_{\text{b}} = 1.8 \times 10^{-5}$, $K_{\text{sp}} = 1.8 \times 10^{-11}$