

Name: _____

Ksp Equilibrium Test

1. Determine the maximum possible concentration of Mg^{2+} ion in p.p.m. in a solution of 0.25 M KOH.

2. What mass of Ag_2S in mg is required to saturate 45000 L of water (yes that is forty five thousand litres of solution).

3. Use the fact that 53.9 mg of Ag_2CrO_4 will saturate 2.50 L of solution, to determine the K_{sp} value for this salt. Use the table of K_{sp} values to check your answer.

4. What mass of CuCl in mg will dissolve in 750 mL of 0.66 M CaCl_2 solution?

5. Determine the identity and mass of precipitate that will form when 250 mL of 2.8×10^{-4} M $\text{Ca}(\text{NO}_3)_2$ is mixed with 500 mL of 1.0×10^{-4} M Na_2CO_3 . Express your mass answer in mg.

Bonus Question: Chloride ion is often used to test for the presence of Ag^{1+} ion through a precipitation reaction (i.e formation of AgCl precipitate). The problem is that other ions can form precipitates with chloride ion as well. Suppose you had a solution with the following composition:

$$[\text{Cu}^{1+}] = 35 \text{ p.p.m.}$$

$$[\text{Ag}^{1+}] = 0.05 \text{ p.p.m.}$$

What $[\text{Cl}^{1-}]$ will cause precipitation with Cu^{2+} ? What $[\text{Cl}^{1-}]$ will cause precipitation with Ag^{1+} ? What range of $[\text{Cl}^{1-}]$ will cause precipitation of one ion and not the other. What mass of NaCl would be required to initiate precipitation of the second ion for a 1L solution?