

Solubility Equilibria Worksheet

4. a) 5.0 mg AgCl in 1.0 L H₂O $K_{sp} = 1.6 \times 10^{-10}$

$$(3.5 \times 10^{-5} M)^2 = 1.2 \times 10^{-9} = Q \quad Q > K_{sp} \text{ will not dissolve}$$

convert g \rightarrow mol
mol/L = M

b) 5.0 mg NiCO₃ in 1.0 L H₂O $K_{sp} = 1.4 \times 10^{-7}$

$$(4.2 \times 10^{-5} M)^2 = 1.8 \times 10^{-9} = Q \quad Q < K_{sp} \text{ will dissolve.}$$

c.) 5.0 mg MgF₂ in 125 mL H₂O $K_{sp} = 6.4 \times 10^{-9}$

$$(6.4 \times 10^{-4} M) \times (1.3 \times 10^{-3})^2 = 1.0 \times 10^{-9} = Q \quad Q < K_{sp} \text{ will dissolve.}$$

d.) .50g CaF₂ in 100.0 mL H₂O $K_{sp} = 4.0 \times 10^{-11}$

$$(.664)(.128)^2 = 1.0 \times 10^{-3} = Q \quad Q > K_{sp} \text{ will not dissolve}$$

5. a) $Ba^{2+} + SO_4^{2-} \rightarrow BaSO_4$ $K_{sp} = 1.5 \times 10^{-9}$

$$\frac{.10 \text{ mmol}}{40 \text{ mL}} \quad \frac{.15 \text{ mmol}}{40 \text{ mL}}$$

↓ ↓

$$2.5 \times 10^{-3} M \quad 3.8 \times 10^{-3} M$$

$$Q = [2.5 \times 10^{-3} M][3.8 \times 10^{-3} M] = 9.5 \times 10^{-6}$$

$Q > K_{sp}$ will not dissolve

b) $Sr^{2+} + SO_4^{2-}$ $K_{sp} = 7.6 \times 10^{-7}$

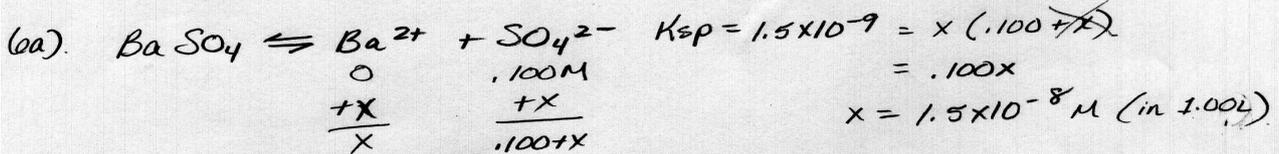
$$\frac{.025 \text{ mmol}}{40.0 \text{ mL}} \quad \frac{.030 \text{ mmol}}{40.0 \text{ mL}}$$

↓ ↓

$$6.25 \times 10^{-4} M \quad 7.5 \times 10^{-4} M$$

$$Q = [6.25 \times 10^{-4} M][7.5 \times 10^{-4} M] = 4.7 \times 10^{-7}$$

$Q < K_{sp}$ will dissolve



$$1.5 \times 10^{-8} \text{ mol} \times \frac{233.37 \text{ g}}{1 \text{ mol}} = 3.5 \times 10^{-6} \text{ g } BaSO_4$$