Solubility Equilibria Worksheet

convert g → mol
$\frac{mol}{L} = M$

4. a) 5.0 mg AgCl in 1.0L H_2O $K_{sp} = 1.6 \times 10^{-10}$

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

b.) 5.0 mg $NiCO_3$ in 1.0L H_2O $K_{sp} = 1.4 \times 10^{-7}$

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

c.) 5.0 mg MgF_2 in 125mL H_2O $K_{sp} = 6.4 \times 10^{-9}$

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

d.). .50g CaF_2 in 100.0mL H_2O $K_{sp} = 4.0 \times 10^{-11}$

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

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

$\frac{.10 mmol}{40 mL}$ → $2.5 \times 10^{-3} M$ $\frac{.15 mmol}{40 mL}$ → $3.8 \times 10^{-3} M$

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

$Q > K_{sp}$ will not dissolve

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

$\frac{.025 mmol}{40.0 mL}$ ⇓ $6.25 \times 10^{-4} M$ $\frac{.030 mmol}{40.0 mL}$ ⇓ $7.5 \times 10^{-4} M$

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

$Q < K_{sp}$ will dissolve

(6a). $BaSO_4 \rightleftharpoons Ba^{2+} + SO_4^{2-}$ $K_{sp} = 1.5 \times 10^{-9} = x(.100 + \cancel{x})$

	Ba^{2+}	SO_4^{2-}
	0	.100M
	+x	+x
	x	.100+x

$= .100x$

$x = 1.5 \times 10^{-8} M$ (in 1.00L)

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