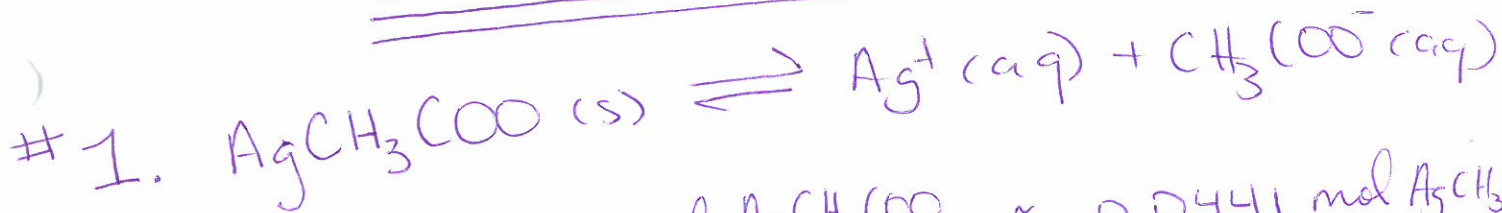


# SOLUBILITY REVIEW



$$\frac{1.84 \text{ g AgCH}_3\text{COO}}{0.2500 \text{ L}} \times \frac{1 \text{ mol AgCH}_3\text{COO}}{166.9 \text{ g AgCH}_3\text{COO}} \approx \frac{0.0441 \text{ mol AgCH}_3\text{COO}}{\text{L}}$$

107.9  
24.0  
32.0  
3.0

$$K_{sp} = [\text{Ag}^+][\text{CH}_3\text{COO}^-]$$

$$\therefore [4.41 \times 10^{-2}][4.41 \times 10^{-2}]$$

$$\boxed{K_{sp} = 1.94 \times 10^{-3}}$$



$$K_{sp} = [\text{Mg}^{2+}][\text{CO}_3^{2-}] = 6.8 \times 10^{-6}$$

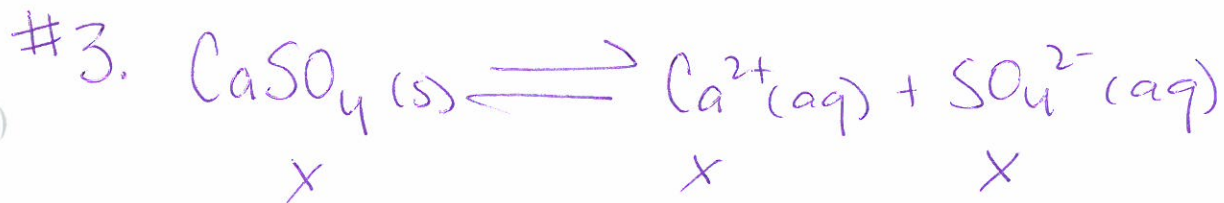
$$\therefore \sqrt{x^2} = \sqrt{6.8 \times 10^{-6}}$$

$$x = \frac{2.6 \times 10^{-3} \text{ mol}}{1 \text{ L}} \times 2.0 \text{ L} \approx 0.0521 \text{ mol}$$

Mg = 24.3  
C = 12.0  
3 O = 48.0  
84.3

$$0.0521 \text{ mol MgCO}_3 \times \frac{84.3 \text{ g MgCO}_3}{1 \text{ mol MgCO}_3} \approx 0.440 \text{ g MgCO}_3$$

$$\therefore 1.00 \text{ g} - 0.4396 = \boxed{0.56 \text{ g MgCO}_3 \text{ is undissolved}}$$



$$K_{sp} = [\text{Ca}^{2+}][\text{SO}_4^{2-}] = 7.1 \times 10^{-5}$$

$$\therefore \sqrt{x^2} = \sqrt{7.1 \times 10^{-5}}$$

$$x = \frac{8.43 \times 10^{-3} \text{ mol CaSO}_4}{1} \times 0.1000 \text{ L} =$$

$$\text{Ca} = 40.1$$

$$\text{S} = 32.1$$

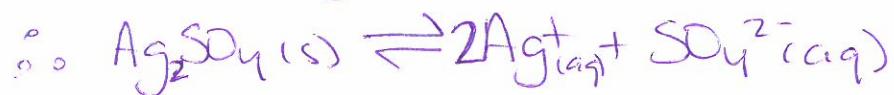
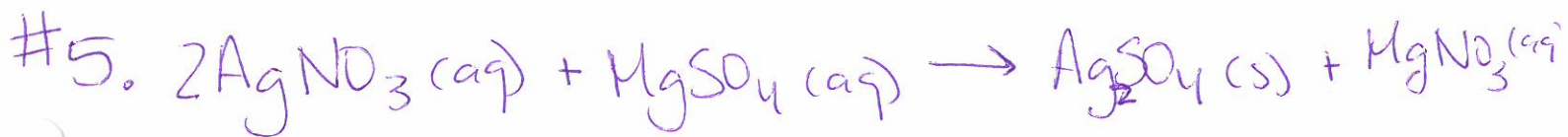
$$40 = \frac{64.0}{136.2}$$

$$8.43 \times 10^{-4} \text{ mol} \times \frac{136.2 \text{ g CaSO}_4}{1 \text{ mol CaSO}_4} = \boxed{0.11 \text{ g CaSO}_4}$$



① Decrease the temperature to shift the equilibrium to the reactant side

② Add a soluble compound containing either  $\text{Ag}^+$  (ie  $\text{AgNO}_3$ ) or  $\text{IO}_3^-$  (ie  $\text{NaIO}_3$ ) to increase the  $\text{con} [ ]$ 's + shift the rxn to the reactant side.

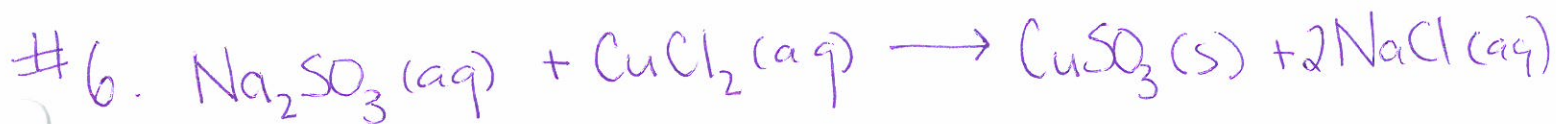


$$K_{sp} = [\text{Ag}^+]^2 [\text{SO}_4^{2-}]$$

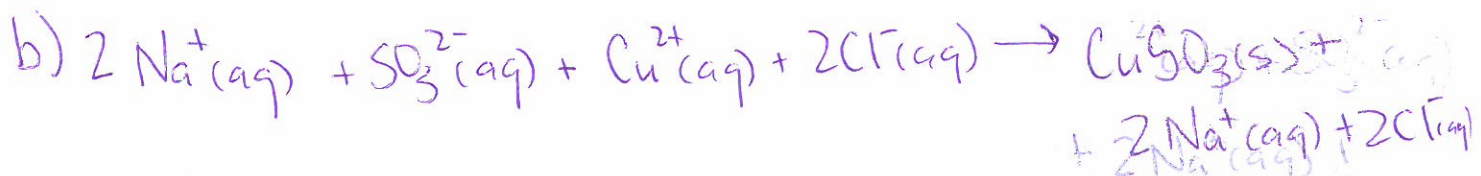
$$\text{Beaker \# 1} \quad K_{sp} = [0.025]^2 [0.024] = 1.5 \times 10^{-5}$$

$$\text{Beaker \# 2.} \quad \frac{1.5 \times 10^{-5}}{[0.050]^2} = \frac{[0.050]^2 [x]}{[0.050]^2}$$

$$\boxed{6.0 \times 10^{-3} \text{ M} = [\text{SO}_4^{2-}]}$$



a)  $\text{CuSO}_3(\text{s})$  is the ppt that forms



c)  $\text{Na}^+(\text{aq}) + \text{Cl}^-(\text{aq})$  are the spectator ions.

$$\#7. [\text{Ca}(\text{NO}_3)_2]_F = \frac{0.600 \text{ M} \times 0.1000 \text{ L}}{0.5000 \text{ L}} = 0.120 \text{ M Ca}(\text{NO}_3)_2$$

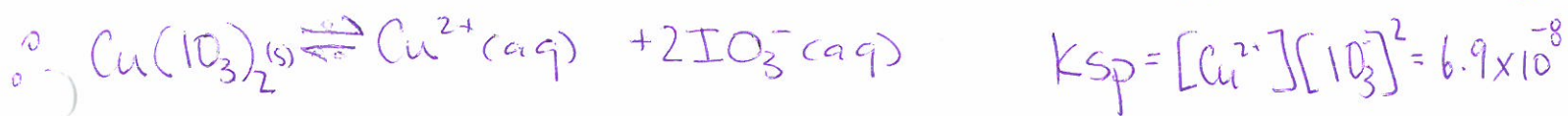
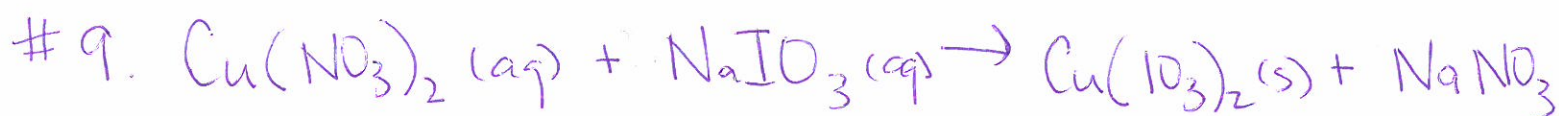
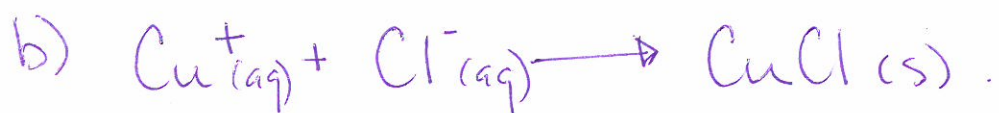
$$\boxed{[\text{Ca}^{2+}] = 0.120 \text{ M}}$$

$$\boxed{[\text{NO}_3^-] = 0.240 \text{ M}}$$

#8.

	Ag <sup>+</sup>	Pb <sup>2+</sup>	Cu <sup>+</sup>
Cl <sup>-</sup>	PPT	PPT	PPT
SO <sub>4</sub> <sup>2-</sup>	PPT	PPT	-

a) ∴ you could add Cu<sup>+</sup> to ppt off the Cl<sup>-</sup>!

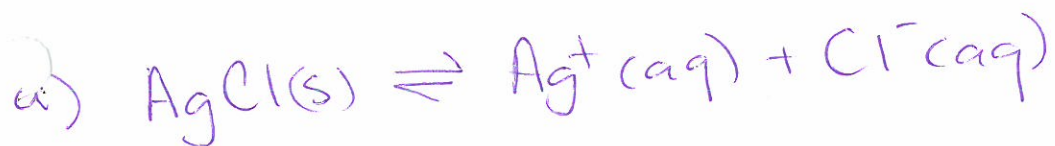


$$[\text{Cu}(\text{NO}_3)_2]_F = \frac{1.00 \times 10^{-2} \text{ M} \cdot 0.0900 \text{ L}}{0.1000 \text{ L}} = 9.00 \times 10^{-3} \text{ M} \quad \therefore [\text{Cu}^{2+}] = 9.00 \times 10^{-3}$$

$$[\text{NaIO}_3]_F = \frac{1.00 \times 10^{-2} \text{ M} \cdot 0.0100 \text{ L}}{0.1000 \text{ L}} = 1.00 \times 10^{-3} \text{ M} \quad \therefore [\text{IO}_3^-] = 1.00 \times 10^{-3}$$

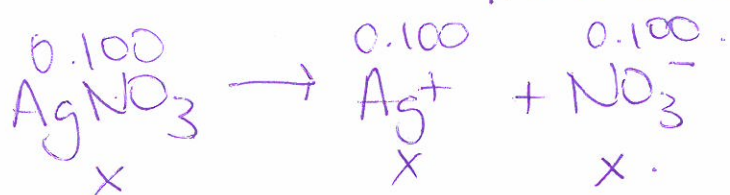
$$\begin{aligned} \text{I.P.} &= [9.00 \times 10^{-3}][1.00 \times 10^{-3}]^2 \\ &= 9.00 \times 10^{-9} < 6.9 \times 10^{-8} \quad \therefore \text{No PPT forms!} \end{aligned}$$

#10.



$$b) \begin{array}{r} \text{Volume} = 27.22 \text{ mL} \\ \text{AgNO}_3 \quad - 18.20 \text{ mL} \\ \hline \end{array}$$

$$9.02 \text{ mL} \rightarrow 0.00902 \text{ L}$$



$$\therefore \frac{0.100 \text{ mol Ag}^+}{1\text{L}} \times 0.00902 \text{ L} = 9.02 \times 10^{-4} \text{ mol Ag}^+$$

$$\rightarrow 9.02 \times 10^{-4} \text{ mol Ag}^+ \times \frac{1 \text{ mol Cl}^-}{1 \text{ mol Ag}^+} = 9.02 \times 10^{-4} \text{ mol Cl}^-$$

$$[\text{Cl}^-] = \frac{9.02 \times 10^{-4} \text{ mol Cl}^-}{0.02500 \text{ L}} = \boxed{0.0361 \text{ M Cl}^-}$$