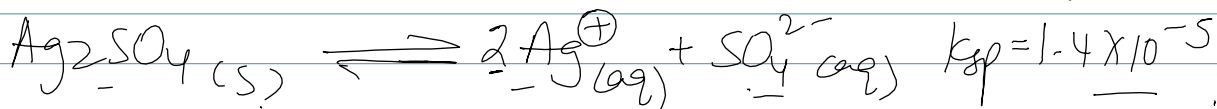


Sapna Gupta

K_{sp} ② Molar Solubility & Conc. of ions.

① Calculate the molar solubility of silver sulfate



$$K_{sp} = 1.4 \times 10^{-5} = (2s)^2 (s) \quad \text{(S)}$$

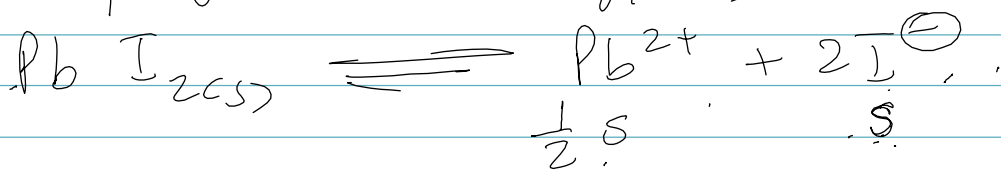
$$= 4s^3$$

$$\sqrt[3]{\frac{1.4 \times 10^{-5}}{4}} = s = 1.5 \times 10^{-2} \text{ M}$$

molar sol. of Ag_2SO_4 $1.5 \times 10^{-2} \text{ M SO}_4^{2-} \times \frac{1 \text{ mol Ag}_2\text{SO}_4}{1 \text{ mol SO}_4^{2-}}$

$$= \boxed{1.5 \times 10^{-2} \text{ M}}$$

② Calculate the conc. in ppm in a saturated solution of PbI_2 $K_{sp} \text{ PbI}_2 = 7.1 \times 10^{-9}$. (density of solution is 1 g/mL).



$$7.1 \times 10^{-9} = \left(\frac{1}{2}s\right) (s)^2 = \frac{1}{2}s^3$$

$$s = \boxed{2.04 \times 10^{-3} \text{ M}} \quad (\text{molar solubility})$$

$$2.04 \times 10^{-3} \frac{\text{mol}}{\text{L}} \times \frac{127 \text{ g I}^-}{1 \text{ mol}} \times \frac{1 \text{ L}}{1000 \text{ mL}} \times \frac{1 \text{ mL}}{1 \text{ g}} \times \left(\frac{10^6}{1000}\right)$$

$$= \boxed{3.1 \times 10^2 \text{ ppm}}$$