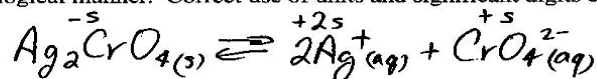


10. Calculate the molar solubility of silver chromate in water at 25°C. Show all your steps in a logical manner. Correct use of units and significant digits counts (3 marks)



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

$$K_{sp} = (2s)^2 s$$

$$K_{sp} = 4s^3$$

$$s^3 = \frac{K_{sp}}{4} \quad \text{or} \quad s = \sqrt[3]{\frac{K_{sp}}{4}}$$

$$= \sqrt[3]{\frac{1.1 \times 10^{-12}}{4}}$$

$$= 6.5 \times 10^{-5} \text{ M}$$

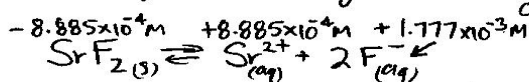
Answer  $6.5 \times 10^{-5} \text{ M}$

11. At a certain temperature 0.0558 grams of  $\text{SrF}_2$  will dissolve in 500.0 mL of water. Calculate the  $K_{sp}$  for  $\text{SrF}_2$  at this temperature. Show all your steps in a logical manner. Correct use of units and significant digits counts (3 marks)

$$g \rightarrow \text{mol} \rightarrow \text{M}$$

$$0.0558 \text{ g SrF}_2 \times \frac{1 \text{ mol}}{125.6 \text{ g}} = 4.4427 \times 10^{-4} \text{ mol}$$

$$\text{M (molar solubility)} = \frac{4.4427 \times 10^{-4} \text{ mol}}{0.5000 \text{ L}} = 8.885 \times 10^{-4} \text{ M}$$



$$K_{sp} = [\text{Sr}^{2+}][\text{F}^-]^2$$

$$= (8.885 \times 10^{-4})(1.777 \times 10^{-3})^2$$

Answer  $K_{sp} = 2.81 \times 10^{-9}$

12. Which is **most** soluble in water at 25 °C, lead (II) bromide, lead (II) chloride, lead (II) iodide, or lead (II) iodate? (2 marks)

Answer  $\text{PbCl}_2$ . How did you obtain your answer? All the same type ( $\text{AB}_2$ )  $\text{PbCl}_2$  has the highest  $K_{sp}$

13. Which is **least** soluble in water at 25 °C, lead (II) bromide, lead (II) chloride, lead (II) iodide, or lead (II) iodate? (2 marks)

Answer  $\text{Pb}(\text{IO}_3)_2$ . How did you obtain your answer? All the same type.  $\text{Pb}(\text{IO}_3)_2$  has the lowest  $K_{sp}$ .

$\frac{10}{10}$