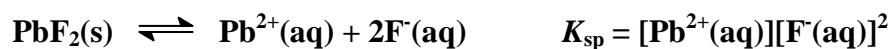


Marks
2

- The molar solubility of lead(II) fluoride, PbF_2 , is found to be $2.6 \times 10^{-3} \text{ M}$ at 25°C . Calculate the value of K_{sp} for this compound at this temperature.

The solubility equilibrium and constant for $\text{PbF}_2(\text{s})$ are,



As one moles of $\text{Pb}^{2+}(\text{aq})$ and two moles of $\text{F}^{-}(\text{aq})$ are produced for every mole of $\text{PbF}_2(\text{s})$ which dissolves, $[\text{Pb}^{2+}(\text{aq})] = 2.6 \times 10^{-3} \text{ M}$ and $[\text{F}^{-}(\text{aq})] = (2 \times 2.6 \times 10^{-3}) = 5.2 \times 10^{-3} \text{ M}$. Hence,

$$K_{\text{sp}} = (2.6 \times 10^{-3}) \times (5.2 \times 10^{-3})^2 = 7.0 \times 10^{-8}$$

$$K_{\text{sp}} = 7.0 \times 10^{-8}$$