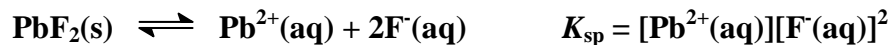


- The molar solubility of lead(II) fluoride,  $\text{PbF}_2$ , is found to be  $2.6 \times 10^{-3} \text{ M}$  at  $25^\circ\text{C}$ . Calculate the value of  $K_{\text{sp}}$  for this compound at this temperature.

**Marks**  
**2**

**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,**

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

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