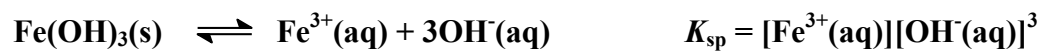


- The  $K_{sp}$  for  $\text{Fe}(\text{OH})_3$  is  $2.64 \times 10^{-39}$ . What is its molar solubility in water?

**Marks**  
**2**

**The dissolution reaction and its equilibrium constant expression are:**



**The molar solubility is the number of moles that dissolve in a litre. If  $s$  mol dissolves in a litre:**

$$[\text{Fe}^{3+}(\text{aq})] = s \text{ M} \quad \text{and} \quad [\text{OH}^{-}(\text{aq})] = 3s \text{ M}$$

**Hence:**

$$K_{sp} = (s)(3s)^3 = 27s^4 = 2.64 \times 10^{-39}$$

**so**

$$s = 9.94 \times 10^{-11} \text{ M}$$

**Answer:  $9.94 \times 10^{-11} \text{ M}$**