

TOPIC

Chemistry – Question 4

QUESTION

The solubility product for silver chloride (AgCl) is 1.7×10^{-10} . The solubility of AgCl in 0.001 normal hydrochloric acid (HCl) in mol/lit is:

- (A) 1.7×10^{-10}
- (B) 0.85×10^{-10}
- (C) 1.7×10^{-7}
- (D) 1.3×10^{-5}

HINT

Remember the common ion effect.

SOLUTION

The solubility product is given by

$$[\text{Ag}] [\text{Cl}] = 1.7 \times 10^{-10}$$

where [Ag] and [Cl] are the concentrations of silver ion and chloride ion in moles/lit.

Suppose X moles/lit of AgCl dissolve. Then [Ag] = X.

Assuming the hydrochloric acid is completely dissociated, the concentration of chloride would be X + 0.001.

Thus

$$X(X+0.001) = 1.7 \times 10^{-10}$$

$$X = 1.7 \times 10^{-7} \text{ mol/lit.}$$

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