Q1 - 2024 (05 Apr Shift 2)

Given below are two statements :

Statement I : On passing $HCl_{(g)}$ through a saturated solution of $BaCl_2$, at room temperature white turbidity appears.

Statement II : When HCl gas is passed through a saturated solution of $NaCl$, sodium chloride is precipitated due to common ion effect.

In the light of the above statements, choose the most appropriate answer from the options given below :

(1) Both Statement I and Statement II are correct

(2) Statement I is correct but Statement II is incorrect

(3) Both Statement I and Statement II are incorrect

(4) Statement I is incorrect but Statement II is correct

Q2 - 2024 (08 Apr Shift 2)

Given below are two statements :

Statement (I) : A Buffer solution is the mixture of a salt and an acid or a base mixed in any particular quantities.

Statement (II) : Blood is naturally occurring buffer solution whose pH is maintained by H_2CO_3/HCO_3^- Θ concentrations.

In the light of the above statements, choose the correct answer from the options given below :

(1) Statement I is true but Statement II is false

(2) Both Statement I and Statement II are true

(3) Statement I is false but Statement II is true

(4) Both Statement I and Statement II are false

Q3 - 2024 (09 Apr Shift 2)

For a sparingly soluble salt AB_2, the equilibrium concentrations of A^{2+} ions and B^- ions are 1.2×10^{-4}M and 0.24×10^{-3}M, respectively. The solubility product of AB_2 is :

(1) 6.91×10^{-12}

(2) 0.276×10^{-12}

(3) 27.65×10^{-12}

(4) 0.069×10^{-12}

Answer Key

Q1 (2) **Q2** (3) **Q3** (1)

Q1

$BaCl_2, NaCl$ are soluble but on adding $HCl(g)$ to $BaCl_2, NaCl$ solutions, Sodium or Barium chlorides may precipitate out, as a consequence of the law of mass action.

Q2

Buffer solution is a mixture of either weak acid / weak base and its respective conjugate.

Blood is a buffer solution of carbonic acid H_2CO_3 and bicarbonate HCO_3^-

Statement 1 is false but Statement II is true.

Q3

$$AB_{2(s)} \rightleftharpoons A^{+2}_{(aq)} + 2\,B^{-}_{(aq)}$$

$$K_{sp} = \left[A^{+2}\right]\left[B^{-}\right]^2$$

$$= 1.2 \times 10^{-4} \times \left(2.4 \times 10^{-4}\right)^2$$

$$= 6.91 \times 10^{-12} M^3$$