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HOME ASSIGNMENT

ACIDS, BASES AND SALTS

Q1. Distinguish between the concept of knowing acids and bases on basis of Arrhenius Theory and Lewis Theory.

Ans- * According to Arrhenius theory,

- An acid is a substance which when dissolved in water, ionizes & releases [$H^+(aq)$] hydrogen ions / proton in sol^n.

Eg: (i) $HCL(aq) \longrightarrow H^+(aq) + Cl^-(aq)$

(ii) $H_2SO_4(aq) \longrightarrow 2H^+(aq) + SO_4^{2-}(aq)$

- A base is a substance that gives hydroxide or hydroxl ions (OH^-) in their aqueous sol^n.

Eg: (i) $NaOH(aq) \longrightarrow Na^+(aq) + OH^-(aq)$

(ii) $KOH(aq) \longrightarrow K^+(aq) + OH^-(aq)$.

* According to Lewis theory,

- An acid is an electron acceptor.
- A base is an electron donor.

2. Althous NH_3 doesn't contain any (OH^-) ions, it still behaves as a base. Why?

Ans- * Ammonia (NH_3) when dissolved in water forms an aqueous sol^n to form ammonium hydroxide.

* NH_3 readily ionizes to form (NH_4^+) ions & (OH^-) ions.

So $NH_3 + H_2O_{(2)} \longrightarrow NH_4OH\,(aq)$

$NH_4OH\,(aq) \longrightarrow NH_4^+ + OH^-$

As, OH^- ions are released into aqueous sol^n; NH_3 is a base.

3. what is the oxidation state of K-atom in $KMnO_4$?

Ans- Oxidation state of any group I alkali metal is $\underline{+1}$.

- So, O.S of K-atom is also $\underline{+1}$.

Also; $KMnO_4 \longrightarrow$ net charge on molecule is $\underline{0}$.

So, $x + (+7) + (-2)(4) = 0$

for $\underline{K}$

$\Rightarrow x + 7 - 8 = 0$

$\Rightarrow x = +1$ — O.S of $\underline{K}$ in $KMnO_4$.

→x←