Guru Aanklan

| Combined	Std.-X / Science & Technololgy Chapter 1, 2, 3	Solutions

Q.1 **Answer the following sub-questions :**

(1) (a) The chemical formula for Gypsum is $CaSO_4 \cdot 2H_2O$ **...[1 M]**

(b) Elements present in Group 3 to 12 are called transition elements. **...[1 M]**

(2) State whether the following statements are True or False

(a) The pH of rain water is 7.

False : The pH of rain water is less than 7 **...[1 M]**

(b) Reactions accompanied by absorption of heat are called endothermic reactions. **...[1 M]**
True.

Q.2 **Attempt any five of the following** :

(1) When metal carbonate react with acids they form corresponding salt, carbon-dioxide gas and water. **...[1 M]**

Example :

$$Na_2CO_3(s) + 2HCl(aq) \rightarrow NaCl(aq) + H_2O(\ell) + CO_2(g)\uparrow$$
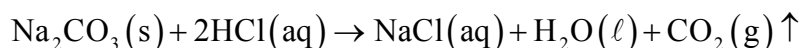
$$NaCl(aq) \rightarrow Sodium\ chloride(salt)$$

$$CaCO_3(s) + 2HCl(aq) \rightarrow CaCl_2(aq) + H_2O(\ell) + CO_2(g)\uparrow$$

$$CaCl_2(aq) \rightarrow Calcium\ chloride(salt)$$

(2) The tendency to lose electron and form positive ions is called metallic character. **...[½ M]**

Across the period nuclear attraction increases due to increase in atomic number and atomic size decreases. **...[1 M]**

Hence elements cannot lose electrons easily. **...[½ M]**

Therefore metallic character decreases from left to right in a period.

(3) **Define**

(a) Rancidity : When oils and fats are oxidized or even allowed to stand for along time, it starts frothing up and its smell turns foul. This condition is called Rancidity. **...[1 M]**

(b) Saponification : The process of alkaline hydrolysis of oils or fats is called saponfication. **...[1 M]**

(4) The two application of sodium carbonate (soda) are

(a) Sodium Carbonate is used in washing clothes as a cleansing agent. **...[1 M]**

(b) It is useful in making of detergent powder, paper and glass. **...[1 M]**

(c) It is also used to refine petroleum

(5) (i) A mixture of several indicators is called universal indicator. It is used to find acidity or basicity of a solution and determines pH of a solution.

(ii) Since $Mg(OH)_2$ magnesium hydroxide is also a base, and sodium hydroxide is also a base, they both cannot react with each other. **...[1 M]**

(6) Atomic size is determined by atomic radius. **...[½ M]**

Atomic radius is the distance between centre of an atom and its outermost shell. **...[½ M]**

In a group, atomic radius increases from top to bottom. **...[½ M]**

i.e. $F < Cl < Br < I$

This happens due to addition of new shells, the outermost electrons go farthest from the nucleus, extending the radius and thereby increasing the size of the atom. **...[½ M]**

Q.3 Attempt any two of the following :

**(1)** **Demerits of Mendeleev's periodic table : (any three) points (1 mark each)**

(i) No fixed position was given to hydrogen as it showed properties of alkali metals as well as halogens

(ii) Isotopes of same element have different atomic nass number, so each element should be given different position. Chemically similar isotopes had to be given same position.

(iii) Elements of higher atomic mass were placed before an element of lower atomic mass

Eg. : Cobalt (Co = 58.93) and is placed before Nickel (Ni = 58.71)

(iv) Some elements placed in the same sub-group had different properties.

Eg. : Manganese is placed with halogens which have totally different properties.

(2) **Hydronium ion :**

Separation of HCl into H^+ and Cl^- will be possible only in presence of water. **...[½ M]**

Hydrogen ions cannot exist alone. **...[½ M]**

They will always combine with water and form hydronium ion (H_3O^+). **...[1 M]**

$$(H^+)aq + (H_2O)\ell \rightarrow \underset{\text{hydronium ion}}{(H_3O^+)}$$ **...[1 M]**
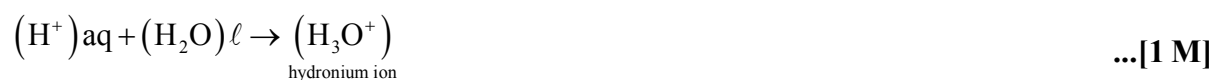
(3) **pH scale :**

(i) pH scale helps in measuring concentration of hydrogen ions. **...[½ M]**

(ii) In pH 'p' stands for potenz which means strength in German. **...[½ M]**

(iii) The pH scale reads from 0 to 14. **...[½ M]**

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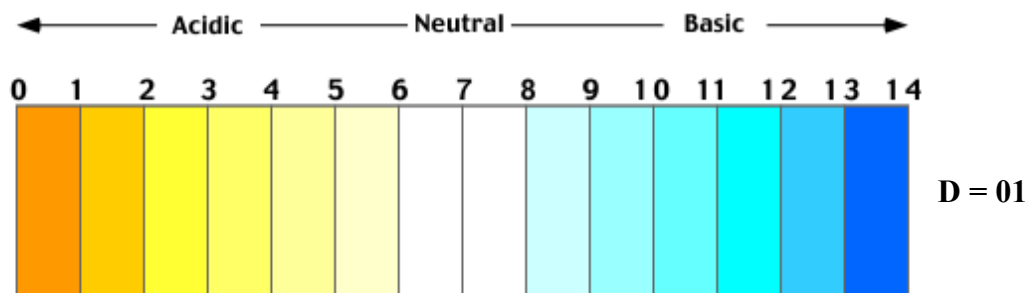
(iv) pH determines acidity or basicity of a solution. **...[½ M]**