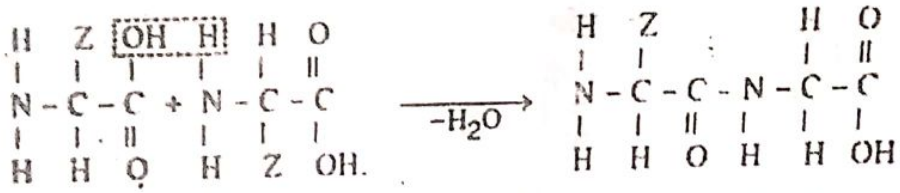
The dipolar ion is called Zwitter ion. The position of equilibrium depends on pH of the solution. Amino acids are soluble in water and have high m.p.s. like ionic compounds. This confirms the existence of Zwitter ion. In Zwitter ion, the acid centre is $-\overset{\oplus}{N}H_3$ not the free –COOH and the basic centre is –COO not the free $-NH_2$. Low values of Ka & Kb are consistent with the Zwitter ion structure of amino acids.

**Q.67. What are isoelectric point of amino acids ?**

**Ans. :** At the lowest pH, the conjugate acid of glycine (amino acid), $-\overset{\oplus}{N}H_3-CH_2COOH$ predominates. In an electric field, these ions migrate to the opposite electrodes. But at some intermediate pH, no such migration occurs as electrically neutral Zwitter ion dominates the equilibrium. This intermediate pH is called isoelectric point of amino acids. This is the characteristic property of amino acids, so an amino acid can be identified by it.

**Q.68. Amino acids are building blocks of proteins. Justify.**

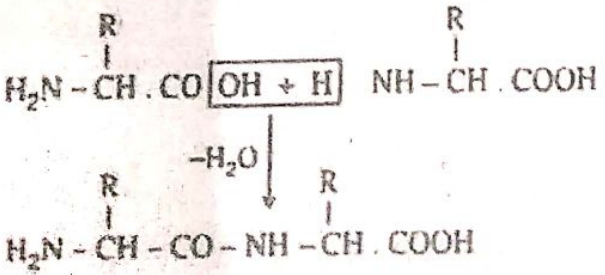
**Ans. :** Amino acids link together to form a peptide (–CO – NH –) bond by the the loss of $H_2O$.



Polyamides of amino acid units attached by peptides bonds are called proteins. Thus proteins have entirely amino acid chains. Therefore amino acids are building blocks of proteins.

**Q.69. What is peptide linkage ? What is the difference between polypeptides and proteins.**

**Ans. :** We know that the amino acid molecules have both basic $-NH_2$ as well as acids –COOH groups. These two groups undergo an intermolecular reaction with the elemination of a water molecule—



We see that every two amino acids are linked by –CO – NH – group. This group is called peptide linkage.

When many amino acid molecules unite through peptide linkages in the

linear way, the condensation product is called a **polypeptide.** Naturally occuring polypeptides are called proteins. The peptides having 10–50 amino acid molecules are called polypeptides, while the peptides having more than fifty amino acid molecules are called **proteins.**

**Q.70. What are Organometallic compounds ?**

**Ans. :** The alkyl derivatives of metals are generally called **organometallic compounds.** In these compounds, metal is directly attached to carbon atom. Mg, Zn, Pb and Si alkyls are most important e.g.

(i) ***Grignard Reagent :*** $C_2H_5 - Mg - Br$

ethyl magnesium bromide

(ii) ***Diethyl Zinc*** $(C_2H_5)_2$ **Zn :** These are versatile synthetic organic compounds available in the hands of chemists.

**Q.71. What are Grignard's reagents ?**

**Ans. :** Organometallic compounds in which both R and halide (X) groups are directly attached to the central magnesium atom are called **Grignard reagents,** where R is an organic group derived from aliphatic, aromatic, alicyclic or heterocyclic compounds e.g. methyl magnesium bromide, $CH_3 - Mg - Br$. Therefore, Grignard reagents have the general formula $R - Mg - X$. They are extremely valuable in lab organic syntheses.

**Q.72. Describe the preparation of methyl magnesium iodide.**

**Ans. : Preparation of a Grignard reagent e.g. methyl magnesium iodide. $CH_3MgI$ :** It is prepared by the action of methyl iodide on Mg in presence of dry ether.

$$CH_3I + Mg \rightarrow CH_3MgI$$

Ether should be absolutely dry. 150 ml. of ether are first washed with water to remove any alcohol, and then dried over anhydrous $CaCl_2$ and finally distilled over metallic Na. $CH_3I$ is also dried by standing over anhydrous $CaCl_2$ and then distilled over $CaCl_2$. Mg-ribbon is made absolutely clean and bright by rubbing first with sand paper and then with filter paper and then cut into small pieces. These are washed with ether to remove grease and then dried 4 g. of this clean Mg pieces are weighed and put in a flask fitted with reflux condenser carrying a $CaCl_2$ tube at the upper end 25 g. of dried $CH_3I$ and 15 ml. of purified and dried ether are mixed and poured over Mg in the flask. Small crystals of iodine are added to catalyse the reaction. The reaction becomes vigorous