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Iso-electric Point :-

We know that if a solution of charged ions is placed in an electric field, the negative ions migrate towards the positive electrode (the anode). The positive ions migrate towards the negative electrode (the cathode). A neutral molecule, of course, is not attracted to any of the two electrode.

In acidic solution, an amino acid exists as a positive ion and migrates toward the cathode. In basic solution the amino acids exist as a negative ion and migrates toward the anode. At a certain pH, that is hydrogen ion concentration, the amino acid molecule will not migrate to either electrode and exist as a neutral dipolar ion. This pH is called the iso-electric point of that amino acid.

All amino acids do not have the same iso-electric point. The iso-electric point value depends upon other functional groups in the amino acid structure. Neutral amino acids have iso-electric point from pH 5.5 to 6.3. Acidic amino acids have isoelectric points at low pH around 3. Basic amino acids have isoelectric points at a high pH around 10. The isoelectric points of some amino acids are

Alanine – 6.1 (neutral amino acid)
valine – 6.0 (neutral amino acid)
Aspartic acid – 2.8
Glutamic acid – 3.2
} (acidic amino acid)
Lysine – 9.7
Arginine – 10.8
} (Basic amino acid)

Amino acids have minimum solubility in water at their isoelectric points. This fact has been made use in the separation of α-amino acids from Protein hydrolysates.