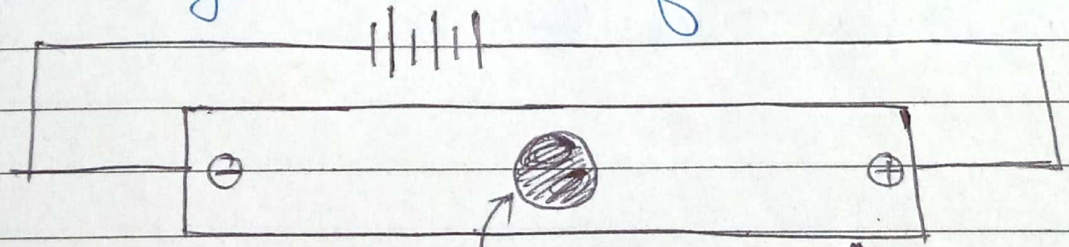
Electrophoresis

Electrophoresis is a method used for the separation and analysis of amino acids. The method is based on pH control and electric charge. The amino acid differ in their isoelectric points. The mixture of amino acid is placed on the centre of a paper strip (cellulose acetate) at certain pH. The pH is maintained by saturating the paper strip with the buffer solution. The paper stripe is attached to two electrodes. On passing current through the stripe amino acids migrate towards electrodes depending upon the net charge present on them.

For example a mixture of lysine alanine and glutamic acid at pH = 6.0 when placed on a paper strip, on passing current results in the movement of glutamic acid towards anode and lysine towards cathode. The alanine has no net charge and therefore does not move



Mixture of amino acid
(Lysine + Glutamic acid + Alanine)

Paper stripe at pH = 6.

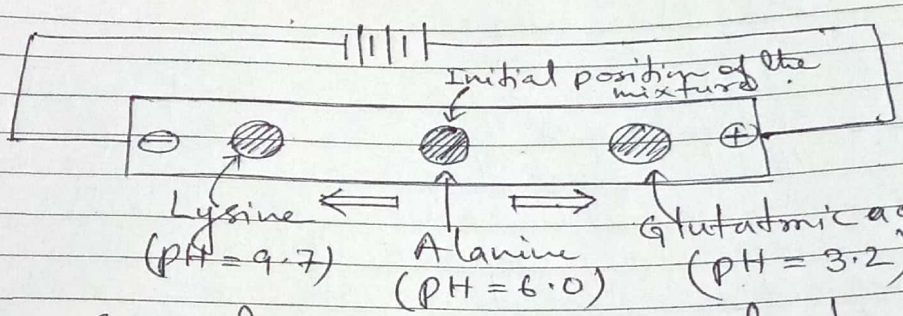


Fig: Separation of amino acids by electrophoresis.

The amino acid with isoelectric point greater than the buffer ~~solution~~ pH gains a proton and becomes positively charged (Lysine, pI = 9.7) and thus moves towards cathode. On other hand the amino acid with isoelectric point lower than the buffer pH looses a proton and becomes negatively charged (Glutamic acid, pI = 3.2) and thus moves towards anode. The amino acid with isoelectric point compareable to buffer pH does not migrate towards any electrode, such as Alanine, pI = 6.0.