B. Sc. Part I (Hons.)
ANALYTICAL ORGANIC CHEMISTRY
Group - "C" | - By Dr. Manju Kumari

(b) Molecular weight determination of Organic acids by Silver salt method :—

Determining molecular weights of Organic acids is based on the fact that they form insoluble silver salts which upon heating decompose to leave a residue of metallic silver.

Procedure :

A small quantity of unknown acid dissolved in water solvent and treated with ammonium hydroxide. The excess of Ammonia is boiled off. To this is added sufficient quantity of Silver nitrate, when a white ppt is formed The ppt is separated by filtration, washed with water, alcohol and ether and then dried in the steam oven.

Calculations: Let the weight of the silver salt taken be x gm and the weight of the residue of metallic silver be a gm.

The wt. of silver salt that would leave 108 gm. (equivalent wt. of Ag.)

of residue $= \frac{x}{a} \times 108$ and

this is the equivalent wt. of the salt

But Eq. wt. of Acid = Eq. wt. of Ag salt − Eq. wt of Ag + Eq. wt of H

$= \frac{x}{a} \times 108 - 108 + 1 = \frac{x}{a} \times 108 - 107$

Molecular wt. of the Acid. = Eq. wt × Basicity

$= \left(\frac{x}{a} \times 108 - 107\right) \times n$

Exam. questions;

Q. 1. How will you determine molecular wt. of an Organic Acid by Silver salt method?

Q. 2. 0.759 g. of the Silver salt of a dibasic Organic acid was ignited, when a residue of 0.463 g. of metallic ~~Salt~~ Silver was left. Calculate the molecular wt. of the acid.