SUBJECT - CHEMISTRY
CLASS - B.Sc (Hons) PART - III
PAPER - V
TOPIC - photochemical reactions

Dr Hari Mohan prasad Singh
Department of Chemistry
Dr. L.K.V.D College Tajpur Samastipur

Q what are photochemical reactions?

Ans photochemical reactions are those reactions, which are carried out by the absorption of photons. A photon is a unit quantum (hv) of electromagnetic radiation -

$$E = h\nu$$

where h is the planck's constant and ν is frequency of the radiation. A photochemical reaction requires absorption of photons of a definite energy by reactants. photons supply the necessary energy for the activation of reactants which enables them to react and form the products.

It involves two main processes - primary and secondary. The initial process of absorption is called primary process and the processes followed by it are called secondary processes. photochemical reactions are generally chain reactions

How do photochemical reactions differ from thermal or dark reactions ?

Ans. we know that chemical reactions occur only when reactant molecules must have the required activation energy. If they acquire it by taking heat in absence of light, Then such reactions are called thermal reactions. If they acquire it by taking electromagnetic radiation. Then such reactions are called photochemical reactions.

While the rates of photochemical reactions depend only upon the intensity of radiation but not on temperature, the Thermal reaction rates depend upon the temperature. Hence temperature co-efficient of photochemical reactions are much lower than that of Thermal reactions.

Thermal reactions are always followed by decrease in free energy while many photochemical reactions viz, photosynthesis, involve increase in free energy. In thermal reactions, the activation energy of reactants are acquired by the collisions whereas in photochemical reactions, it is acquired by the absorption of radiation. In photochemical reactions, a few molecules succeeding in absorbing quanta are strongly excited while in Thermal reactions, the rise in temperature increases the average energy of all molecules. Light absorption brings about reactions at room temperature which might require high temperature in dark.