

applications in the prediction of shelf life.

INFLUENCE OF LIGHT ON DRUG DEGRADATION

Light energy, like heat, activate molecules and enhance the rate of a reaction. Drugs which undergo light-induced chemical degradation are called *photolabile* (photosensitive) *drugs*. A few examples are riboflavin, tetracycline, chlorpromazine. Colour development or colour fading of tablets and liquids are also a few examples of photochemical degradation. A few familiar photochemical reactions are: (a) conversion of ergosterol to vitamin D by ultraviolet light, and (b) Photosynthesis wherein carbohydrates and oxygen are produced when chlorophyll absorbs visible light.

The energy unit of radiation is known as the *photon* and it is equal to one quantum of energy. The energy of a photon is directly proportional to the frequency of the absorbed radiation (or inversely proportional to the wavelength). The photochemical decomposition of pharmaceuticals is due to the absorption of sunlight particularly in the spectral region of visible blue, violet and ultraviolet wavelengths (500 to 300 nm). Thus, the light sources employed in the testing of drug decomposition are sunlight, artificial light and ultraviolet rays (arc light or mercury vapour lamp). A proper frequency and sufficient energy must be absorbed by the molecules in order to activate them. Therefore, strict attention has to be paid to control these parameters

Photochemical reactions are usually complex and proceed in several steps. These reactions usually follow zero order kinetics. Examples are chlorpromazine, reserpine and colchicine. However, drugs such as adriamycin, furosemide and nifedipine have shown to exhibit first order photokinetics.

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