The intrinsic photostability characteristics of new drug substances should be evaluated to demonstrate that, as appropriate, light exposure does not result in unacceptable change. Normally, photostability testing is carried out on a single batch of material. Under some circumstances, these studies should be repeated if certain variations and changes are made to the product (e.g., formulation and packaging). Whether these studies should be repeated depends on the photostability characteristics determined at the time of initial filing and the type of variation and/or change made.

A systematic approach to photostability testing is recommended, covering, as appropriate, studies such as light sources and the procedures used. The light sources described next may be used for photostability testing, while maintaining the temperature to avoid these effects to confound light effects. Any light source that is designed to produce an output similar to the D65/ID65 emission standard, such as an artificial daylight fluorescent lamp combining visible (VIS) and UV outputs, xenon, or metal halide lamp can be used. D65 is the internationally recognized standard for outdoor daylight, as defined in ISO 10977 (1993). ID65 is the equivalent indoor indirect daylight standard. For a light source emitting a significant radiation below 320 nm, an appropriate filter(s) may be fitted to eliminate such radiation. An alternate source of light is a cool white fluorescent lamp designed to produce an output similar to that specified in ISO 10977 (1993) and a near-UV fluorescent lamp having a spectral distribution from 320 nm to 400 nm, with a maximum energy emission between 350 nm and 370 nm; a significant proportion of UV should be in both bands of 320–360 nm and 360–400 nm.

For confirmatory studies, samples should be exposed to light providing an overall illumination of not less than 1.2 million lux hours and an integrated near-UV energy of not less than 200 watt h/m^2 to allow direct comparisons to be made between the drug substance and the drug product. Samples may be exposed side by side with a validated chemical actinometric system to ensure that the specified light exposure is obtained or for the appropriate duration of time when conditions have been monitored using calibrated radiometers/lux meters. If protected samples (e.g., wrapped in aluminum foil) are used as dark controls to evaluate the contribution of thermally induced change to the total observed change, these should be placed alongside the authentic sample.

The photostability testing should consist of two parts: forced degradation testing and confirmatory testing. The purpose of forced degradation testing studies is to evaluate the overall photosensitivity of the material for method development purposes and/or degradation pathway elucidation. This testing may involve the drug substance alone and/or in simple solutions/suspensions to validate the analytical procedures. In these studies, the samples should be in chemically inert and transparent containers. In these forced degradation studies, a variety of exposure conditions may be used, depending on the photosensitivity of the drug substance involved and the intensity of the light sources used. For development and validation purposes, it is appropriate to limit exposure and end the studies if extensive decomposition occurs. For photostable materials, studies may be terminated after an appropriate exposure level has been used. The design of these experiments is left to the applicant's discretion; however, the exposure levels used should be justified.

Under forced conditions, decomposition products that are unlikely to be formed under the conditions used for confirmatory studies may be observed. This information may be useful in developing and validating suitable analytical methods.