Liquisolid technique: a promising alternative to conventional coating for improvement of drug photostability in solid dosage forms

Abstract:

Objective: The objective of this study was to investigate the photoprotective effect of liquisolid technique on amlodipine, a calcium channel blocker antihypertensive drug, representing a photosensitive drug model. Method: Several liquisolid formulations were prepared using propylene glycol as a water-miscible nonvolatile vehicle at drug/solvent ratio (1:1), Avicel PH 102 as a carrier, nanometer-sized amorphous silicon and titanium dioxide either alone or in combination as coating materials. The carrier/coat ratio (R) was varied from 5 to 50. The prepared liquisolids, coated, noncoated tablets and drug substance were irradiated with a light dose of 0.5 W/m2/h visible light, 55.1 W/m2/h UVA, and 0.247 W/m2/h UVB for 8 h. The effect of coating material type and (R) value on the drug dissolution rate and photostability was studied. Results were statistically analyzed by post hoc two-way ANOVA at a probability level (a = 0.05). Results: The results indicated that liquisolid technique not only improved the dissolution rate, but also significantly inhibited the photodegradative effect of different light energies in all prepared Liquisolid formulations. The residual drug percentage reached 97.37% in comparison to 73.8% for the drug substance after 8 h of irradiation. The residual drug percentage was affected by the (R) value. Statistically; the detected difference was significant at the selected probability level (a = 0.05). Conclusion: It can thus be concluded that this Liquisolid technique is a promising alternative to conventional coating procedures in formulations containing photosensitive drugs.

Keywords: amlodipine, liquisolid, photostability, refractive index, silicon dioxide, titanium dioxide.