



Preservation of plumbagin by using inclusion complex: Freeze drying recovery of inclusion complex

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Plumbagin is an active compound extracted from *Plumbago indica* root which can be used in Thai herbal drugs due to its cytotoxic property. The major drawback of plumbagin is its low sublimation temperature at 0°C which results in the deterioration of the drug's properties. In order to preserve plumbagin, an inclusion complexation by using beta-cyclodextrin (β CD) was used. In this study, the recoveries of the solid inclusion complex of plumbagin from solution were investigated by using filtration, modified rotary evaporator with ethanol-acetone coolant, and freeze drying. Amongst these techniques, freeze drying provides the highest inclusion complex's recovery rate up to 74.5%. The solid inclusion complexes were characterized by FT-IR and HPLC. The sublimation rate of plumbagin in form of the solid inclusion complexes was conducted. The results show the reduction of sublimation rate from 64.2% to 1.3% per day at 25°C.

Keywords: Plumbagin; β CD; Inclusion complexation; Inclusion complex recovery