



Comparative Curcumin Solubility Enhancement Study of β -Cyclodextrin (β CD) and its Derivative Hydroxypropyl- β -Cyclodextrin (HP β CD)

Haroon K. SYED and Kok K. PEH*

*School of Pharmaceutical Sciences,
Universiti Sains Malaysia, 11800 Minden, Penang, Malaysia*

SUMMARY. The solubility enhancement ability between β -cyclodextrin (β CD) and its derivative hydroxypropyl- β -cyclodextrin (HP β CD) was compared using curcumin (Cur) as model compound. Cur- β CD and Cur-HP β CD at ratio of 1:1, 1:2, 1:4, and 1:8 were prepared by kneading method. The phase solubility studies illustrated that Cur solubility increased proportionally with an increase in β CD and HP β CD concentration. The solubility of Cur was significantly higher when complexed with HP β CD than β CD. Cur- β CD/HP β CD complexes were examined critically using infrared (FTIR), differential scanning calorimetry (DSC), powder X-ray diffraction (XRD) and scanning electron microscopy (SEM). FTIR and SEM did not show any significant difference between Cur- β CD/HP β CD complexes. DSC thermograms of Cur-HP β CD showed a decrease in the intensity of endothermic peak of Cur more than Cur- β CD. XRD results indicated that Cur shifted to amorphous state when complexed with HP β CD but retained its crystalline nature with β CD. In conclusion, HP β CD is more preferable than β CD to increase the solubility of curcumin.

KEY WORDS: β -cyclodextrin, Curcumin, Hydroxypropyl- β -cyclodextrin, Solubility.

* Author to whom correspondence should be addressed. *E-mail:* kkeph@usm.my; kkephken@gmail.com