Thesis Title Properties of Glibenclamide/β-Cyclodextrin Inclusion Complexes Prepared by Spray Drying Technique

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ABSTRACT

This study attempted to investigate the nature of complex formation between glibenclamide (GB) and β-cyclodextrin (β-CD) and to prepare the complex by spray drying process. Phase solubility study in pH 7.4 phosphate buffer suggested that the solubility of GB increased β-CD, showing the formation of a 1:1 complex of A_L type. GB and β-CD at the ratios of 1:1 and 1:2 in aqueous alcoholic solution were spray dried. The products were characterized by scanning electron microscopy (SEM), differential scanning calorimetry (DSC), powder X-ray diffraction (PXRD) and Fourier transformed infrared (FTIR) spectroscopy. The results indicated that inclusion complex was obtained. Moreover, FTIR study revealed the possible existence of the intermolecular hydrogen bonds between the drug and β-CD. Directly compressed GB tablets were prepared, the percentage of GB dissolved at 90 min was in the rank order of 1:1 GB/β-CD inclusion complex (96.26%) ≈ 1:2 GB/β-CD inclusion complex (95.76%) > spray dried GB (65.76%) > 1:1 GB/β-CD physical mixture (62.24%) ≈ 1:2 GB/β-CD physical mixture (60.83%) >

plain drug (56.30%). It was concluded that inclusion complex could be prepared by spray drying method.