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THANUN SUWANTHEP : PHYSICOCHEMICAL PROPERTIES OF FREEZE-DRIED CEPHALEXIN POWDER CONTAINING SOME EXCIPIENTS. THESIS ADVISOR : SATIT PUTTIPIPATKHACHORN Ph.D., PETER J ROGERS Ph.D., POJAWON LAWANPRASERTP Ph.D. 208 p. ISBN 974-588-943-1

Freeze-drying technology has been used for preparation of parenteral powder for reconstitution. In this study, a freeze-dried powder was prepared by freezing an aqueous cephalexin solution containing excipients at -80 °C and then vacuum drying in a freeze-dryer. The excipients, i.e., mannitol, lactose, glycine, polyvinylpyrrolidone (PVP) 10 and PVP40 were used at 2:1, 1:1 and 1:2 w/w drug to excipient ratio. X-ray diffraction, differential scanning calorimetry and Fourier transformed infrared spectroscopy were used to investigate the physicochemical characteristics of the freeze-dried powder and the physical mixture. Both physical and chemical stability of the freeze-dried powder as well as the physical mixture were also investigated after storage at 45 °C for 12 weeks. The crystalline freeze-dried powder was obtained when mannitol and glycine were used due to recrystallization of the excipients. Lactose, PVP10 and PVP40 give amorphous freeze-dried samples. After storage, only the freeze-dried powder with lactose at 1:2 w/w ratio was recrystallized. As cephalexin existed in amorphous state in the freeze-dried powder, it degraded at higher extent than the physical mixtures. In this study, lactose at 1:2 w/w ratio and glycine at 1:1 w/w ratio have been found to be appropriate excipients as the appearance of the freeze-dried cake is favorable and less degradation of drug has been observed.