

ABSTRACT

CHARLES UNIVERSITY

Faculty of Pharmacy in Hradec Králové

Department of Pharmaceutical Technology

Name of the student: **Mgr. Karolína Vodičková**

Title of rigorous thesis:

Aciclovir loaded solid dispersions plasticized with methyl salicylate

Consultant: PharmDr. Eva Šnejdrová, Ph.D.

Rigorous thesis deals with the study of rheological, thermal and dissolution properties of biodegradable drug carriers. The theoretical part describes the properties of plasticizers, branching monomers and polymers derived from α -hydroxy acids. In the experimental part, solid dispersions made from star-like polyester of lactic and glycolic acids, branched on pentaerythritol, plasticized with methyl salicylate (MS) in concentrations of 20 %, 30 % and 40 %, were prepared. Aciclovir (ACV) was incorporated as the drug. Thermal analysis of solid dispersions was performed by DSC. It has been confirmed that MS is efficient plasticizer of star-like polyester already in concentration of 20 %. The viscosity was measured at the shear rate range from 0,1 to 10 s⁻¹ at three temperatures, and the data were analysed by Newtonian model. The viscosity for easy processing, drug incorporation, and application is achieved at 25 °C with the addition of 40 % MS. The dissolution test of aciclovir was performed in a water bath with an integrated shaking platform at 37 °C. The amount of aciclovir released was determined by HPLC. A significant difference in aciclovir release from polymeric system plasticized with 20 % MS and 30 % MS was found. ACV was released 7 days for the plasticization with 20 % MS. Using 30 % MS, the release time was shortened to 24 hours. A further increase in MS concentration to 40 % ACV did not affect the release time.