

ABSTRACT

Title of thesis: Characterization of PLGA-based film forming systems
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The aim of this thesis is to review available sources on film forming systems (FFSs), to test characteristics of poly(lactic-*co*-glycolic acid) of low molar mass linear or branched configuration in combination with multifunctional plasticizers and to formulate salicylate loaded film forming system. The theoretical section is focused on general characteristics and excipients used for FFs formulation and testing methods. Besides that, mathematical models commonly used for evaluation of flow behaviour are included.

In the experimental section, effects of plasticizers ethyl pyruvate, methyl salicylate and triacetin on the rheological and adhesive properties of the polyesters were tested to select the optimal combination. All tested plasticizers decrease the viscosity of the polymers with ethyl pyruvate being the most effective. The flow curves of plasticized PLGA were analysed to Power law and Newton models revealing the Newton character of the systems. The evaluation of viscoelastic behavior showed liquid-like characteristic of these systems. The adhesive properties were determined by the pull away test providing the detachment force and time necessary for force to decrease by 90%. The highest adhesiveness was found in case of the most viscous systems. FFSs loaded with salicylic acid were prepared and their structure was studied with SEM showing good homogeneity. The images confirmed molecularly dispersed drug in PLGA determined by DSC. Finally, the dissolution of salicylates was tested. Prolonged release of salicylates within 11 days was found with a linear pattern within first 5 days.

Keywords: film forming system, branched polyesters, plasticizer, rheological properties, adhesive properties