ABSTRACT

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Title of diploma thesis: Rheological behavior of branched polyesters

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This thesis studies rheological and thermal properties of potencial polyester drug carrier composed of an equimolar proportion of D,L-lactic and glycolic acids, branched with tripentaerythritol at a concentration of 3%, and its analogs plasticized with methyl salicylate at different concentrations. The theoretical part deals with the characterization of polymers, their plasticizing and rotational rheometry. In the experimental part were prepared plasticized polyesters then were determined their glass transition temperatures using a DSC, and on rotational rheometer was tested their rheological behavior. According to the results of thermal analysis, methyl salicylate significantly lowers the glass transition temperature of the tested polyester and seems to be suitable plasticizer. The resulting data of rheological analyzes show that 3T plasticized polymer exhibits pseudoplastic behavior at 25°C and concentration of methyl salicylate 20% when the viscosity is highest. Viscosity of polymer systems significantly decreases with increasing temperature and concentration of methyl salicylate, and occurs transition to newtonian behavior. Thixotropic behavior was not found.

Key words: *branched polyesters, biodegradable polymers, PLGA, plasticization, rotational rheometer, DSC, Ostwald–de Waele relationship, hysteresis loop*