Abstract

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Title of thesis:	Impact of molecular weight and the grade of branching of aliphatic oligoesters on their hydrolytic degradation

Theoretical part of the thesis deals with behavior, properties and applications of biodegradable polyesters, mainly copolymers of lactic and glycolic acid (PLGA). This part concerns degradation, erosion and release mechanism. Furthermore, it describes properties that influence the drug release kinetics from systems based on PLGA. The final section of theoretical part is focused on the in situ forming implants, whose carrier of active substance is biodegradable polyester. The experimental part analyzes the influence of different pH of the medium within physiologically common boundaries and also the influence of ionic force on the degree of swelling and polymer erosion. These degradation parameters have been studied on three potential polyester carriers of active substances – PLGA, M3 (terpolymer of lactic and glycolic acid with mannit) and T3 (terpolymer of lactic and glycolic acid with tripentaerythritol). Polymer bodies were kept in temperature of 37°C inside phosphate-citrate buffers with various pH and various concentration. Samples were taken out of the thermostat in specific intervals – 1 day, 3, 7, 14 and 21 days. Linear copolymer PLGA reported higher grade of swelling and faster erosion compared to the branched polymers. Simultaneously, it was confirmed that the erosion time extends in line with rising grade of branching.