

ABSTRACT

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Title of Thesis: Pharmaceutical applications of polyesters as drug nanocarriers

Nanoparticles are nowadays intensively studied and perspective type of a drug carrier. Its potential is based on a possibility of targeted drug delivery and controlled drug release.

The theoretical part is about nanoparticles types, polymers derived from α -hydroxyacids (PLA, PGA, PLGA). Focus is given on methods of nanoparticles preparation: dispersion of preformed polymers or the polymerization of monomers. The modification of particles surface and practical use of nanomedicine in healthcare are described in other chapters.

The research in experimental part is focused on the influence of different types of PLGA and their weighing on the size, polydispersity, nanoparticles zeta potential and encapsulation efficiency of rhodamine B. Nanoparticles were prepared by nanoprecipitation method or by solvent evaporation method. The Zetasizer ZS 90 device was used to measure the size of the nanoparticles and to measure zeta potential.

The result of the research shows the most suitable weighing for creation of nanoparticles is 25 mg. The samples of this weighing show a high reproductive rate. Polymer PLGA 3:7 was the only polymer where the influence of weighing was negligible when examining final size of nanoparticles. In comparison to solvent evaporation method nanoparticles with much smaller polydispersity were created by using nanoprecipitation method. Both methods were successful in creation of stable nanoparticles with zeta potential $\pm 30\text{mV}$.