

ROZPRAWA DOKTORSKA

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**Bioresorbowalne poliwęglany i poli(estro-węglany):
synteza, właściwości i próby aplikacji**

Bioresorbable polycarbonates and poly(ester-carbonates): synthesis, properties
and preliminary application

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The paper presents the results on a study on the course of synthesis of several bioresorbable polycarbonates and poly(ester-carbonates), obtained on the ROP way of cyclic carbonates, lactides and ϵ -caprolactone initiated with zinc (II) compounds and characterizes the obtained materials.

Some very effective initiators whose usage would allow to obtain high yield polycarbonates and poly(ester-carbonates) with high molar mass were discovered, namely: monohydrate zinc (II) acetylacetonate, and ethoxy zinc (II). In the presence of said compounds, because of relatively low influence of intermolecular transesterification processes, copolymers with multiblock chain microstructure and high semi-crystallinity were obtained. They revealed much better mechanical resistance properties compared to similar materials known from earlier research.

The work presents also a mechanism of initiation and chain propagation during polymerization processes of lactide and trimethylene carbonate with the use of monohydrate zinc (II) acetylacetonate. Even though the same compounds were used in both cases, the courses of the two reactions were drastically different. The initiation phase of lactide polymerization process consisted of forming of initiating complex on the way lactide deprotonation and the exchange of acetylacetonate ligand with release of acetylacetonate, while the TMC polymerization proceeded according to the activated monomer mechanism.

It was proved that the obtained copolymers are valuable biomaterials with interesting and varied mechanical properties.