RISK-OPENING POLYMERIZATION OF BETA-BUTYROLACTONE UTILIZING AMIDO-OXAZOLINATE ZINC COMPLEXES TO OBTAIN DEGRADABLE POLYMERS

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OBJECTIVES

- Perform ring-opening polymerization of beta-butyrolactone utilizing amido-oxazolinate zinc complexes as catalysts and diol initiators to increase the chain length of linear polyesters with degradable properties.
- Employ nuclear magnetic resonance (NMR), thermal gravimetric analysis (TGA), and differential scanning calorimetry (DSC) to characterize the polymer products.
- To achieve the goal, a Schlenk line was used for optimization of inert conditions.

BACKGROUND

- Plastics are commonly produced from petroleum-based materials.
- These structures of these materials typically do not break down easily, so they accumulate within the environment creating pollution.
- BBL is a petroleum-derived monomer whose structure contains an ester bond.

MATERIALS AND METHODS

**Optimized Reaction**

- Without initiator 1:200
- With initiator 1:1:200

**Formation of Pure Reaction Mixture of ROP of BBL with a catalyst L10**

**RESULTS AND DISCUSSION**

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<th>Initiators</th>
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1°H NMR BBL + 1,4 Cyclohexanediol in CDCl₃

**Polymerization of BBL with a catalyst L10**

1°H NMR spectrum shows the expected coupling and splitting of the polymer chain protons as well as the initiator's presence and the hydroxyl polymer end groups.

**REFERENCES**