

UNIVERSITY OF RHODE ISLAND
Department of Chemistry
SEMINAR

Room 105 Beupre Center
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**“Organocatalytic Ring-Opening Polymerization
of Cyclic Lactones: A Greener Approach to the
Synthesis of Polyesters”**

HOST

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Organocatalytic Ring-Opening Polymerization of Cyclic Lactones: A Greener Approach to the Synthesis of Polyesters

Abstract

A 'greener,' solvent-free approach for the synthesis of biocompatible and sustainable polyesters using organocatalysts has been studied. These polyesters were synthesized by ring-opening polymerization of strained lactones and unstrained macrolactones in the presence of H-bond donor and base co-catalyst systems. The ring-opening polymerizations follow a chain growth type mechanism and display characteristics of living polymerizations, even under solvent-free conditions. The co-catalyst systems showed fast rates without adversely affecting the selectivity of the polymerization which was reflected by the narrow molecular weight distributions. A mechanism for these dual catalyst systems under solvent-free conditions has been proposed. Applications including the one-pot synthesis of previously-inaccessible diblock copolymers, direct-from-monomer 3D printing, and catalytic polymer recycling will be discussed.