

Solvothermal alcoholysis routes for recycling polylactide waste as lactic acid esters.

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Streszczenie

In this work, we investigated the possible use of polylactide (PLA), a biodegradable polymer obtained from renewable biofeedstock, to produce a range of industrially useful lactic acid esters. We describe a simple and convenient solvothermal alcoholysis method for large-scale recycling of PLA resins or residues from disposable packaging in the presence of the appropriate alcohol under catalyst-free or catalytic conditions. This process proceeds easily both without and with a catalyst. The results show that the best catalytic activities involve magnesium and calcium alkoxides synthesized in situ from organometallic or metallic precursors and an alcohol. We determined the crystal structure of the chiral mononuclear postcatalyst $[\text{Ca}(\text{LAc})_2(\text{EL})_2]$ (**1**; LAc = lactic acid anion, EL = ethyl lactate), obtained directly from the reactor. Particular emphasis is placed on the operating conditions and high activity of the catalyst used. Key factors that affect the catalytic activity and reaction mechanism are also highlighted.

Adres publiczny

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Strona internetowa wydawcy

<https://www.acs.org/content/acs/en.html>