

A novel synthetic route to produce biobased poly(succinates) from renewable acrylates

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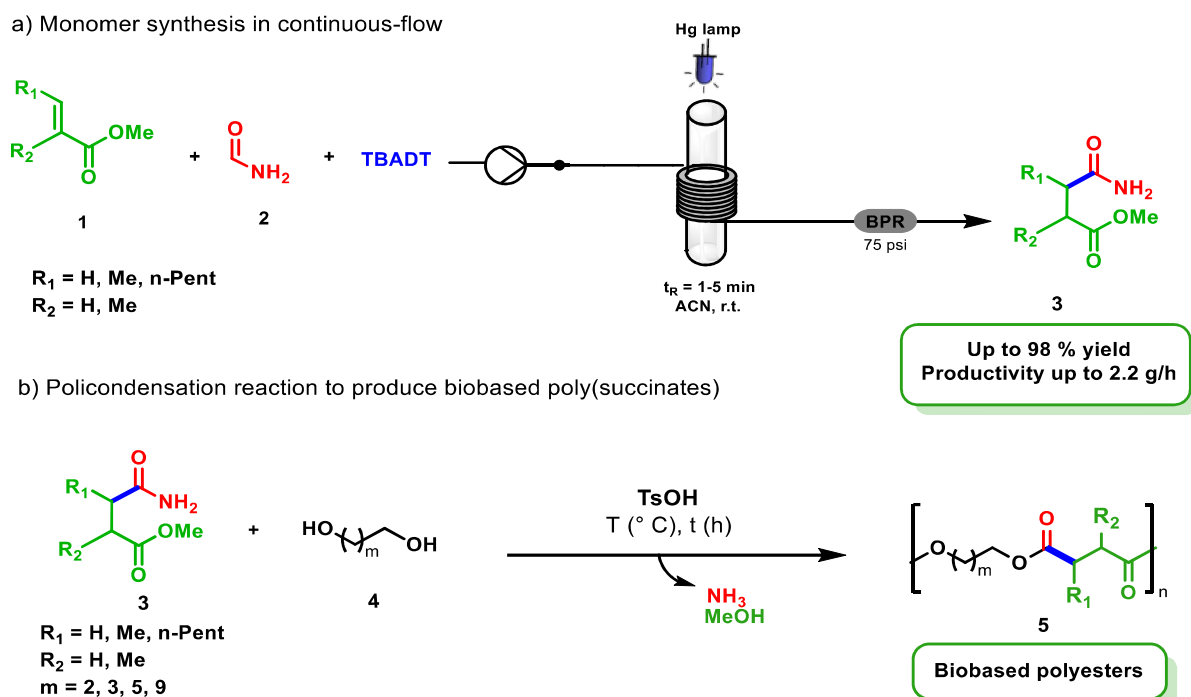
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Highlights

Photocatalytic synthesis of amide-esters in excellent yields and high productivity. Production of biobased poly(succinates) via polycondensation.

Resumo/Abstract

Motivated by the great importance of polymers in our society, this work describes a novel synthetic route for the production of biobased poly(succinates). The first step is the production of renewable amide-esters via a photocatalytic reaction under continuous flow conditions.¹ Formamide, renewable acrylates and the tetrakis(tetrabutylammonium) decatungstate (TBADT) are irradiated with UV light, producing the monomers **3** in excellent yields (up to 98%) and very high productivity (up to 2.2 g/h in a 2 mL reactor) (Scheme 1a). For the second step, a polycondensation reaction of these amide-esters with biobased diols produced the poly(succinates) **5** via alcoholysis of the amide group, releasing only methanol and ammonia as by-products (Scheme 1b).² Polybutylene(succinate) was successfully obtained with $M_w = 2.0$ kDa.



Scheme 1: a) Photocatalytic synthesis of amide-esters from renewable acrylates and formamide b) Polycondensation reaction to produce biobased poly(succinates) via alcoholysis.

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