



PRODUCTION AND UPCYCLING OF POLY(SUCCINATES): A SUSTAINABLE AND CIRCULAR ROUTE

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Motivated by the great importance of polymers in our society, this work proposes a synthetic route for the production and upcycling of biobased poly(succinates). The first step is the photocatalytic carbamoylation of renewable esters **1** under continuous flow conditions, producing the renewable amide-esters **3** with excellent yields (up to 98%) and high productivity (up to 2.2 g/h in a 2 mL reactor).¹ 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.¹ The upcycling step converts poly(succinates) into N-substituted succinimides **6** or succinamides **7** via aminolysis catalyzed by earth abundant metals,² with 100% selectivity and excellent isolated yields (up to 99%). Finally, this work describes the chemical recycling of these compounds by polymerization with diols, producing poly(succinates) in a completely circular pathway (Figure 1).

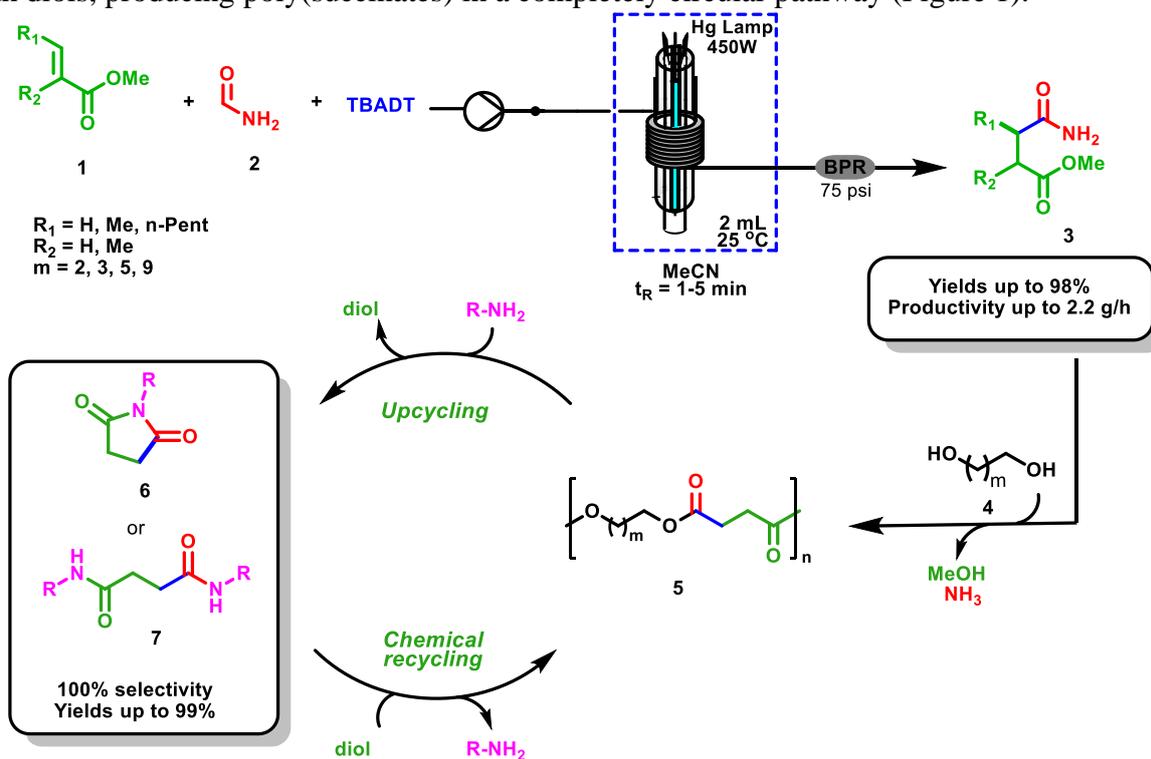


Figure 1: Synthetic pathway proposed for the production and upcycling of poly(succinates).

References

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