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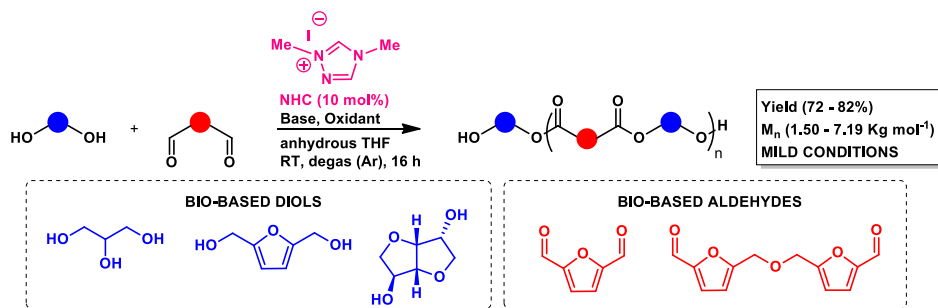
Oxidative NHC-Catalysis: an alternative platform for polyester synthesis by step growth polymerization.

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Organocatalysis has emerged as an efficient tool for polymer synthesis, exhibiting versatility for replacing organometallic catalysts in different polymerization reactions.¹ The growing interest in the preparation of new chemicals and materials based on renewable resources has naturally led to the development of a correspondingly original realm of polymers. In this context, we investigated an alternative route to polyesters, promoted by N-heterocyclic carbene under oxidative conditions.² Polyesters were synthesized starting from dialdehydes and diols, under mild conditions with satisfactory values of yield (72-82%) and M_n (1.50-7.19 Kg mol⁻¹). After a model optimization study on PET synthesis, the design of the synthesized polyesters was driven by their bio-based nature. Indeed, HMF derivatives, isosorbide and glycerol were employed as monomers for the production of different bio-based polyesters. The synthesized polymers are interesting building blocks for polyurethanes production. Interestingly, catalyst tuning resulted to be crucial for linear vs cross-linked polymer selectivity in glycerol-based products. In the future, this protocol will be extended to polyamides synthesis, representing a mild, green and versatile synthetic tool for macromolecules production.



References

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