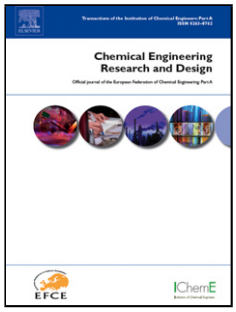

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Sustainable production of chemical intermediates for nylon manufacture: a techno-economic analysis for renewable production of caprolactone

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Research Highlights

- Process model developed for the conversion of biomass to caprolactone via glucose and 5-hydroxymenthyl furfural (HMF)
- Addressed the overall sustainability in terms of economic and environmental impact factor: GHG emissions.
- Efficient approach identified for the separation of 1,5 and 1,6-hexanediol.
- Sustainable bio-based caprolactone production requires the valorisation of major by-products.

Abstract

Caprolactone is a precursor for the synthesis of caprolactam, the key monomer for nylon-6 which is produced globally at a scale of 4 million tons per annum. This work describes and assesses a bio-based production route to caprolactone from an agricultural residue, specifically