Biobased Polymers

Subjects: Polymer Science

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Biobased polymers are polymers whose carbon skeleton derives, wholly or partly, from a renewable feedstock rather than from petroleum. The feedstock can be a sugar, a vegetable oil, a terpene, or a lignin fragment, and the monomer is obtained by fermentation or by chemical conversion [1]. Being biobased says nothing about biodegradability, because a bio-derived polyethylene is chemically identical to the fossil one and does not degrade faster [2]. The properties of the resulting polymer follow from the repeat unit, so a rigid ring in the backbone raises the glass transition while a long aliphatic chain lowers it [3]. The cost of the monomer, not the polymerisation, is what keeps several biobased grades out of the market [4]. The end-of-life route has to be specified at the design stage, because a biobased but non-degradable polymer still needs a waste stream that can handle it [5].

renewable feedstock | biobased monomer | fermentation | bio-derived polyethylene | glass transition | end-of-life | drop-in replacement

References

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