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Biopolymers in the form of polyesters and the polymerization reaction.

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Biopolymers in the form of polyesters were prepared using epoxidised methyl esters of oleic acid (EP_{OAME}) and epoxidised biodiesel (mixture of methyl esters) obtained from sunflower oil (EP_{SOME}) and linseed oil (EP_{LOME}) using cis-1,2-cyclohexanedicarboxylic anhydride and triethylamine as initiator of the polymerization reaction. A model of the polymerization reaction was proposed and the kinetic of partial processes involved were elucidated and related to epoxy rings position in the fatty acid chain. The activation energies (Ea) for the epoxy ring opening by the catalyst are 298, 216 and 136 kJ/mol for EP_{OAME}, EP_{SOME} and EP_{LOME} respectively. The reactions of the epoxy rings in the positions C9–C10, C12–C13 and C15–C16 with anhydride require average activation energies of 116, 32 and 22 kJ/mol, respectively. The compensation effect between activation energy and pre-exponential factor is observed. The polymerisation enthalpy, molecular weight, glass transition temperature and electrical properties were determined. The polyesters studied show promising properties for use in various technological applications.

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