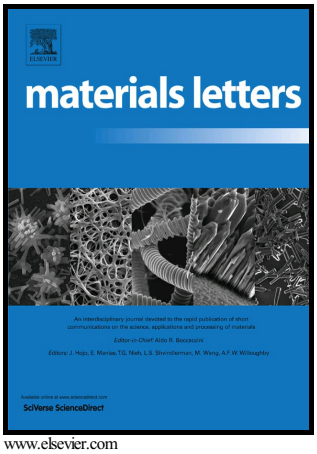

Comparison of static mixing reaction and reactive extrusion technique for ring-opening polymerization of l-lactide

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Comparison of static mixing reaction and reactive extrusion technique for ring-opening polymerization of L-lactide

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ABSTRACT:

In order to compare the static mixing reaction technique and the reactive extrusion technique for synthesizing poly(L-lactide) (PLLA), ring-opening polymerizations (ROPs) of L-lactide were performed in a tubular static mixing reactor (TSMR) and a twin-screw extruder (TSE), respectively. Compared with the results by using the TSE, the PLLA polymers obtained by using the TSMR had a smaller polydispersity index (PDI), higher molecular weight and optical purity. Additionally, the TMSR was also an energy-saving reactor. It provided reactants to have higher collision frequencies among molecules and an excellent mixing performance under lower shear rates. Therefore, the TSMR was an advantageous option to synthesize PLLA.

KEYWORDS: Biomaterials; Polymers; Structural; Tubular static mixing reactor; Ring-opening polymerization; Poly(L-lactide)