

## A New Sustainable Approach Toward Super-tough Polyglycolide-based A-B-A-Type Triblock Copolymer

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A super-tough polyglycolide-*b*-poly(L-)-lactide-*b*-polyglycolide (*b*-PLLGA) triblock copolymer was prepared without sacrificing the excellent intrinsic mechanical strength of *b*-PLLGA. The material was fabricated in a sustainable manner using a simple one-pot conventional ring-opening (ROP) technique with 30 mol% glycolide and (L-)-lactide. The thermal, microstructural, and mechanical properties of the copolymer were characterized and subsequently compared with those of homo-PLLA and random poly(L-)-lactide-co-glycolide (*r*-PLLGA) with a similar molar ratio. The obtained results confirmed that *b*-PLLGA exhibits higher thermal stability and mechanical strength than homo-PLLA and *r*-PLLGA. Compared to *r*-PLLGA, *b*-PLLGA shows a block-type microstructure as well as two glass transitions ( $T_g$ ) and two melt transitions ( $T_m$ ) attributed to blocks of polyglycolide and polylactide, respectively.

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