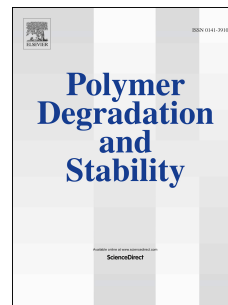


Accepted Manuscript

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PII: S0141-3910(18)30143-5

DOI: [10.1016/j.polymdegradstab.2018.04.033](https://doi.org/10.1016/j.polymdegradstab.2018.04.033)

Reference: PDST 8530

To appear in: *Polymer Degradation and Stability*

Received Date: 13 March 2018

Revised Date: 20 April 2018

Accepted Date: 25 April 2018

Please cite this article as: Marubayashi H, Mizukami R, Hamada Y, Nojima S, Crystallizability of substituted Poly(lactic acid)s: Effects of alkyl side-chain structure, *Polymer Degradation and Stability* (2018), doi: 10.1016/j.polymdegradstab.2018.04.033.

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Crystallizability of Substituted Poly(lactic acid)s: Effects of Alkyl Side-Chain Structure

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KEYWORDS substituted poly(lactic acid), crystallizability, crystallization, *sec*-butyl group, side chain, substituent effect, crystallinity, crystal structure, melting temperature, crystallization rate

ABSTRACT The side-chain-substituted poly(lactic acid)s (SPLAs) having C3–C4 alkyl side chains (Pr, iPr, n-Bu, iBu, and s-Bu for propyl, isopropyl, *n*-butyl, isobutyl, and *sec*-butyl groups, respectively) were synthesized from L-amino acids, and their crystallizability was systematically investigated (unknown for Pr, n-Bu, and s-Bu but already known for iPr and iBu). s-Bu was found to be a crystalline polymer like iPr, whereas Pr and n-Bu had little or no crystallizability like iBu. The crystal structure, melting behavior, and crystallization rate of s-Bu were examined in detail. The crystal structure and crystallinity (ca. 60%) of s-Bu were not affected at all by the crystallization temperature and casting solvent. The melting temperature and spherulite growth rate of s-Bu were compared with those of iPr and referenced data of SPLA with methyl side chains (Me) [i.e., poly(L-lactic acid)] and that with ethyl side chains (Et) [i.e., poly(L-2-

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