

Quantitative Analysis for Reaction Between Epoxidized Natural Rubber and Poly (L-Lactide) Through (1)H-NMR Spectroscopy

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Abstract: Reaction between epoxidized natural rubber and poly(L-lactide) (PLLA) was investigated quantitatively in terms of conversion of the epoxidized natural rubber. The epoxidized natural rubber was prepared by epoxidation of high ammonia natural rubber (HA-NR) or deproteinized natural rubber (DPNR) with peracetic acid followed by depolymerization with ammonium persulfate. The resulting liquid HA-NR having epoxy group (LENR) or liquid DPNR having epoxy group (LEDPNR) were subjected to heating at 473 K for 20 min, after blending with PLLA. The products were characterized through morphology observation, DSC measurement, and (1)H-NMR spectroscopy. The conversions of the rubbers were estimated from intensity ratio of signals in (1)H-NMR spectrum for the products after removing unreacted rubber with toluene. Difference in the estimated conversion between the LENR/PLLA and LEDPNR/PLLA blends was interpreted in relation to proteins present in the rubber. (C) 2009 Wiley Periodicals, Inc. J Appl Polym Sci 115: 3598-3604, 2010

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