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Characterization of Bioderived Polyhydroxyalkanoates by Size Exclusion Chromatography IOAN NEGULESCU, RAFAEL CUETO, KELLY RUSCH, TERESA GUTIERREZ-WING, BENJAMIN STEVENS, Louisiana State University Macromolecular Studies Group — The plant derived polyesters, better known as polyhydroxyalkanoates, PHAs, are renewable and sustainable: [-O-CH(CH3)-(CH2)x-CO-]n. If x = 0 PHA is Poly(lactic acid), PLA; if x = 1 or 2 it is Poly(hydroxy butyrate), PHB, or Poly(hydroxy valerate), PHV. SEC and light scattering have been used before for determination of the absolute molecular mass of PLA dissolved in CHCl3 (Malmgren et al., J. Thermal Anal. Calorim., 2006, 83, 35-40). To our best knowledge there is no publication on the determination of the absolute MW of other PHAs. The bioderived polymers analyzed in this work were four catalog PHA samples: PHB Fluka 81329, PHB Natural Aldrich 363502, 95PHB/5PHV Aldrich 403105, and 92PHB/8PHV Aldrich 403113. SEC/LS instrumentation used: three Phenogel (1K-10000K) columns + a guard column, an Agilent pump and Wyatt Heleos MALS, QUELS (DLS), ViscoStar and rEX DRI detectors, all in series. The experimental dn/dc of PHB in CHCl3 (0.0336 ml/g at 658nm) allowed the determination of absolute MW of all PHA samples: PHB Fluka Mw 345,100 Mn 218,400; PHB Aldrich Mw 335,700 Mn 185,000; 92PHB/8PHV Mw 144,700 Mn 91,970; 95PHB/5PHV Mw 253,000 Mn 193,800.

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