

Synthesis of novel functional aliphatic polyesters by association of ring-opening polymerization and click chemistry

Philippe Lecomte, philippe.lecomte@ulg.ac.be¹, Stéphanie Schmeits, Stephanie.Schmeits@ulg.ac.be¹, Raphael Riva, Raphael.Riva@ulg.ac.be¹, Christine Jerome², and Robert Jerome, rjerome@ulg.ac.be³.

(1) Department of Chemistry, CERM - Liege University, Sart-Tilman, B6, Liege, 4000, Belgium, (2) Center for Education and Research on Macromolecules (CERM), University of Liege, B6 Sart-Tilman, B 4000 Liege, Belgium, (3) CERM - Liege University, Institute of chemistry B6, 4000 Sart Tilman (Liege 1), Belgium

Nowadays, biodegradable and biocompatible aliphatic polyesters are widely used as environmentally friendly thermoplastics and biomaterials. Nevertheless, the absence of any functional group along the chain is a severe limitation for the development of new applications. Very recently, it was reported by Emrick et al. and by us that copper(I)-mediated 1,3-dipolar Huisgen's cycloaddition of alkynes and azides, the most widely used "click" reaction in the frame of macromolecular engineering, is very efficient to derivatize aliphatic polyesters. Due to the tolerance for many functional groups, cumbersome protection and deprotection steps are not needed. One main advantage of copper(I)-mediated Huisgen's cycloaddition compared to other reactions previously used to derivatize aliphatic polyesters relies on the mildness of the experimental conditions, which results in limited degradation. Our most recent results dealing with the combination of "click" chemistry and ring-opening polymerization towards functional PCL and PLA, networks, graft and hyperbranched copolymers will be highlighted