

RAFT-FUNCTIONALIZED POLY (2-ALQUIL-2-OXAZOLINES) REACHED BY NOVEL DUAL AGENT

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Due to their interestingly characteristics, amphiphilic block copolymers are one of the most promising materials that can be used as drug delivery systems in several innovative therapeutic procedures. In these materials, the so-called smart polymers stand out. In this way, poly(2-alkyl-2-oxazolines) is a class of hydrophilic polymers that has the potential to replace poly(ethylene glycol) (PEG) in biomedical applications. Nevertheless, choosing an appropriate method to prepare these amphiphilic block copolymers is not a trivial issue, due to the challenge to polymerize monomers with different chemistry (where the hydrophilic-hydrophobic characteristics play a determinant role), and still achieve good control over the polymer architecture. For instance, hydrophilic polymers can be obtained via ionic controlled polymerizations such as Cationic Ring Opening Polymerization (CROP), however, to prepare amphiphilic block copolymer a key feature is the functionalization at the chain end with a proper chemical group that allows to grow a second hydrophobic monomer through another polymerization method, such as reversible activation-deactivation radical polymerization (RAFT). Herein, we report the synthesis of a dual polymer initiator useful in the preparation of amphiphilic block copolymers considering the CROP-RAFT strategy. Dual polymer initiators are based on asymmetrical trithiocarbonates where one Z group carries a benzylic group and in the other, an alkyl-benzenesulfonate. Dual initiators were obtained in high yields (>90%). And all products were purified and characterized using affordable techniques (¹H and ¹³C, COSY and HSQC NMR spectroscopy and FTIR spectroscopy). Using these initiators, different poly(2-alkyl-2-oxazolines) were obtained in high yields and highly functionalized at the chain end with macro-RAFT agents through CROP polymerization. These hydrophilic polymers were prepared in a microwave reactor at different temperatures, and molar ratios.

Keywords: 2-ALQUIL-2-OXAZOLINES, CROP-RAFT, DUAL

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