

## **Synthesis of poly (methyl methacrylate) by Atom Transfer Radical Polymerization using 2, 2, 2- tribromoethanol as initiator**

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Functional polymeric materials, based on copolymerization between natural and synthetic compounds have been proposed for applications in biomedical, electronic and optical fields. One of the techniques used to obtain functional polymers is the Atom Transfer Radical Polymerization (ATRP), an effective technique of Reversible Deactivation Radical Polymerization (RDRP) that allows the production of polymers with multi functionalities, which is useful for different applications. In this context, the objective of this work is to synthesize a macroinitiator of poly (methyl methacrylate) by ATRP, using 2,2,2 tribromoethanol (TBE) as initiator, which has a hydroxyl group in one of the molecule extremities and a bromide in the other. This compound is widely used in medicine as anaesthesia, but it showed excellent performance as bifunctional initiator in ATRP. In this work copper bromide (I) was used as catalyst and pentamethyldiethylenetriamine (PMDETA) as ligand. This system used less expensive compounds when compared to usual ATRP synthesis, besides it has not been reported in literature so far. The polymerization was carried in bulk and the polymer was characterized by Fourier transform infrared spectroscopy (FT-IR) and hydrogen and carbon nuclear magnetic resonance (<sup>1</sup>H and <sup>13</sup>C NMR), indicating the synthesis of functionalized macroinitiator with syndiotactic triad. The gel permeation chromatography (GPC) indicated dispersity of 1.1, showing a controlled polymerization.

Keywords: Polymerization, Functionalization, ATRP, Macroinitiator, TBE.