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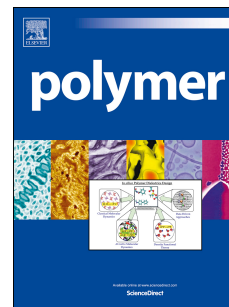
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Synthesis, characterization and catalytic properties of salen-containing polymers obtained by atom transfer radical polymerization

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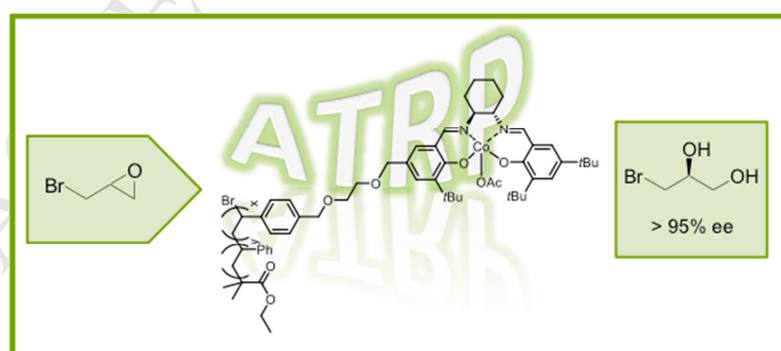
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Abstract

Styrene copolymers containing 5 to 50 mol % of a comonomer with a salen catalytic-active moiety are synthesized by using ATRP in solution. Control of the synthesis is obtained only when the salen comonomer incorporation is less than 10 mol %. In those conditions, first-order kinetics, linear increase of M_n versus time and monomodal narrow molar mass distributions with molar mass dispersities \mathcal{D} in the range 1.28 – 1.33 are satisfactorily achieved. For copolymers with higher incorporated salen comonomer, control of the reaction progressively disappears with dispersities increasing with salen comonomer incorporation up to $\mathcal{D} = 1.72$. Cobalt complexation of those copolymers allows high yield and selectivity in the catalysis of the dynamic hydrolytic kinetic resolution of epibromohydrin. In spite of the loss of polymerization control, the highest (50%) salen incorporation yields the best catalytic results. Under these conditions, the high concentration of Co catalytic sites might favor the formation of bimetallic complexes responsible for the high activity and enantioselectivity.

Graphical abstract



Keywords

ATRP; Copolymerization; Salen; Asymmetric Catalysis

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