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TERPENES-BASED (METH)ACRYLIC POLYMERS

AUTHORS
Laurent BILLON / IPREM UMR 5254 / E2S-UPPA, HELIOPARC, 2 AVENUE ANGOT, PAU

PURPOSE OF THE ABSTRACT

Climate changes resulting from anthropogenic carbon dioxide uses and accumulation in the atmosphere correlated with the uncertainty in the amount of recoverable fossil fuel reserves are driving forces for the development of renewable carbon-neutral energy technologies but also new class of renewable organic materials as bio-based polymers. In particular, extensive research efforts have focused on polymers derived from natural sources, i.e. plants, trees, both to address sustainability objectives and to mimic the physical and chemical properties. Among the wide variety of available renewable resources, terpenes are found in many essential oils and represent a versatile chemical feedstock. A very common terpene can be obtained as a byproduct of the citrus industry and is, being produced by more than 300 plants, i.e. Limonene. Herein, we want to focus on non-polar and hydrocarbon-rich (a)cyclic alkyl terpenes, as the major components of wood turpentine or as one of the main side-products of the Kraft process (Black liqueur), which is used in the paper industry to extract lignin from wood in the production of pulp. We will describe:

1- The synthesis and homopolymerization of monomers based on wood and plants, i.e. terpenes, as ten carbons-based moieties.

2- The elaboration of terpenes-based diblock copolymers by Nitroxide Mediated Radical Polymerization and Reversible Addition-Fragmentation chain-Transfer RAFT in bulk or emulsion polymerization in aqueous phase, as an environmentally friendly process to develop new waterborne formulations.

3- The self-assembly of the designed elastomer/thermoplastic bio-sourced diblock copolymers to target several microphase separations.

FIGURES

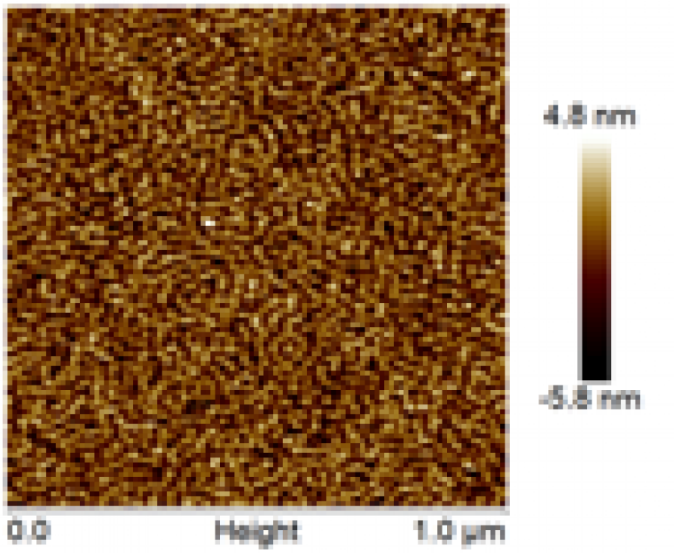

FIGURE 1

Figure 1

AFM imags of elastomer/thermoplastic bio-sourced diblock copolymer with cylindrical nano-segregation

FIGURE 2

KEYWORDS

terpenes | bio-sourced (meth)acrylic monomer | Emulsion polymerization | Block copolymer self-assembly

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