



THINKING GREEN: STUDY OF NEW UNSATURATED RESINS FROM RENEWABLE MONOMERS

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ABSTRACT

In today's society, where plastics have a dominant role in our lives, the accumulation of waste remains one of the major problems. The inability for proper waste management and projections about crude oil's fluctuating price and availability in the near future, have drawn attention to the production of polymers from renewable monomers, the so-called bio-based polymers. Among others, unsaturated polyester resins (UPRs) are one of the most used polymer classes, due to the simplicity of their processing and the variety of fields that they are applied to.

UPRs are linear polycondensation products based on unsaturated and saturated acids/anhydrides and diols or oxides. The unsaturation in the backbone provides sites for reaction with unsaturated monomers using free-radical initiators, thereby leading to the formation of a three-dimensional network. A UPR consists of an unsaturated polymer matrix that is then mixed with an unsaturated monomer called reactive diluent, with which after a thermally or UV induced curing forms a cross-linked network.

The aim of this work is the production of novel unsaturated polyester resins based on succinic acid. Succinic acid is a dicarboxylic acid which is a new biobased monomer with a huge market and environmental potential. The properties of these resins will be enhanced by their mixture with nanocellulose for better mechanical properties. Several characterization methods were utilized to examine physicochemical properties of the materials.

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