One-Pot Synthesis of Polyol from Algae Oil for Sustainable Polyurethanes

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BACKGROUND

A large sector with potential for improvement is the polyurethane industry, which produces versatile polymers and foams for use in many commercial products. Production of these polymers is dependent on precursor polyols. Current production of industrial polyols is dominated by petroleum-derived polyethers, which is unsustainable and presents environmental hazards due to their poor degradation in the environment.

TECHNOLOGY DESCRIPTION

Researchers from UC San Diego have solved some of these and other problems, through their development of one-pot methods for the conversion of algae oils into polyols for application to the production of rigid polurethanes.

The optimization of this procedure employs small organic acids with hydrogen peroxide for a tandem epoxidation – ring opening that occurs in a single reaction sequence. This invention increases the synthesis efficiency of lactic acid substituted polyols through the elimination of an intermediate purification step, and thus this technology is more rapid, less expensive, and uses less toxic reagents than previously reported methods for the conversion of triglycerides to polyol, providing a renewable source of urethane components.

APPLICATIONS

Lactic acid polyol has the potential to be incorporated into rigid polyurethane foams to increase renewability. It has at this point already been utilized in functional surfboards. The process of synthesizing lactic acid polyol has the potential to reduce reaction time and resource cost for polyol manufacturers while developing sustainable products.

INTELLECTUAL PROPERTY INFO

UC San Diego is seeking partners to commercialize this patent-pending technology.

CONTACT

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OTHER INFORMATION

KEYWORDS

Lactic acid polyol, rigid polyurethanes, surfboards, algae oils

CATEGORIZED AS

- **Materials & Chemicals**
  - Polymers

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