

**Non-Confidential Description - PSU No. 3933**  
**"Plant Oil Based Polymers"**

**Keywords:**

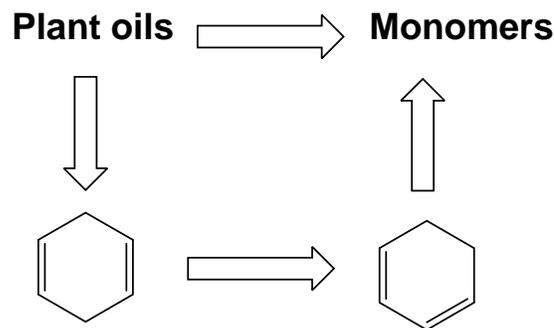
Bio-based polymers, petroleum-based polymers,  
terephthalic acid, plant oils

**Links:**

[Published US Patent Application](#)

**Inventors:**

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**Background**

Currently, petroleum-based aromatic monomers are widely used to prepare polymers due to their rigidity and stability, thereby providing good thermal and mechanical properties. One prominent example of such a polymer is terephthalic acid (PTA), of which the world consumes 9 billion pounds per year. The current synthesis of PTA is based on petroleum derived para-xylene. However, there has been an effort to produce alternatives using renewable bio-based technology. There is a continuing need for polymer processes and products from renewable sources that can substitute or supplement petroleum-based chemicals, such as PTA.

**Invention Description**

The proposed invention is a process for preparing monomers from plant oils. The process results in the production of cyclohexadiene (CHD), which can be transformed into mimic terephthalic acid or other bio-based polymers. A plant oil with a metathesis catalyst produces CHD, which can then be converted to other monomers through isomerization or polymerized to mimic petroleum-based polymers. The preparation of CHD can be performed with little to no plant oil purification, minimal catalyst loading, no organic solvents, and simple product recovery by distillation. These monomers can be used to supplement or substitute petroleum-based monomers traditionally used in the preparation of polymeric materials.

**Advantages/Applications**

- Replace petroleum-based polymers with renewable bio-based polymers
- The world consumes 9 billion pounds of PTA per year alone, which can be reduced by renewable bio-based polymers
- No plant oil purification, minimal catalyst loading, no organic solvents, and simple product recovery by distillation
- Broad availability of raw material