**Thermo-Mechanical Properties of Tung-Oil Based Thermosetting Polymers**

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**MOTIVATION**

THE DEBATE: Petroleum Based vs Agricultural Based Products

- **COST**
- **SUSTAINABILITY**
- **ENVIRONMENTAL**
- **ENERGY**

Research to reduce societies dependency on petroleum products has increased and alternatives to petroleum and petroleum based products are becoming more relevant. Polymers made from bio-renewable resources are rapidly gaining attention as well.

**SELF HEALING POLYMERS**

- In plastics, microcracks often lead to large-scale material damage.

Self-healing polymer can effectively “heal” itself without any manual intervention in order to arrest macrocrack growth, or even stop macrocrack formation by “healing” microcracks

**OBJECTIVE**

- Investigate the thermo-mechanical characteristics of tung oil thermosetting polymers.
- Enhance crack flowing ability of healing agent
- Determine the pros and cons of replacing tung oil triglycerides with tung oil methyl ester on: 1. Storage modulus 2. Cross-link density

**POLYMER SAMPLE**

- The study of the flow of matter
- Used to measure viscosity

**RHEOLOGY**

**POLYMERIZATION PROCESS**

**SOXHLET EXTRACTION**

**ACKNOWLEDGEMENTS**

I would like to thank the Center for Biorenewable Chemicals (CBiRC) for creating the Research Experience for Teachers (RET) and providing me an opportunity to expand my knowledge in engineering and biorenewables. I would also like to thank Dr. Michael Kessler’s polymer composite research group for letting me experience engineering first hand by working in their labs. Special thanks to Peter Hondred for his guidance and sharing his knowledge during the RET experience.

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