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Bio-based Polyurethane Films: Effect of Hydroxyl Numbers on the Properties of the Polyurethane Films

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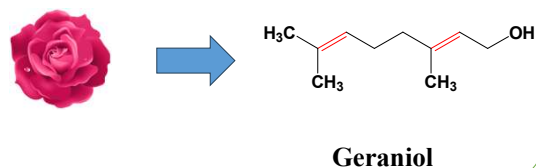
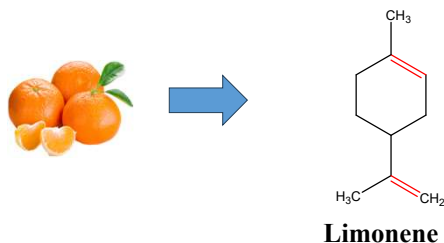
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Introduction

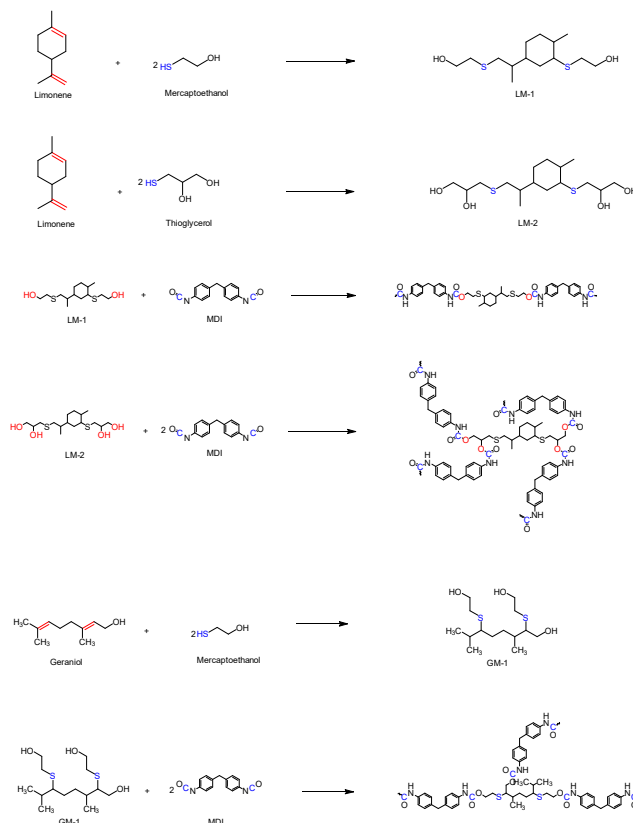
Abstract

- Polyurethanes have become ubiquitous in our surroundings, but their traditional production relies on fossil fuels, posing challenges due to resource limitations and material toxicity. To address this issue, I propose utilizing bio-based materials such as Limonene derived from orange peels, and Geraniol derived from rose, and soybean polyol.
- This research aims to synthesize thiol through thiol-ene click chemistry, involving the reaction of limonene with mercaptoethanol and thioglycerol and reaction of geraniol with mercaptoethanol to produce thiols.
- The primary goal is to investigate the mechanical of polyurethane films as the number of hydroxyl groups increases. The structural morphology will be analyzed using Fourier Transform Infrared Spectroscopy (FTIR), while mechanical properties will be assessed through tensile and hardness tests.



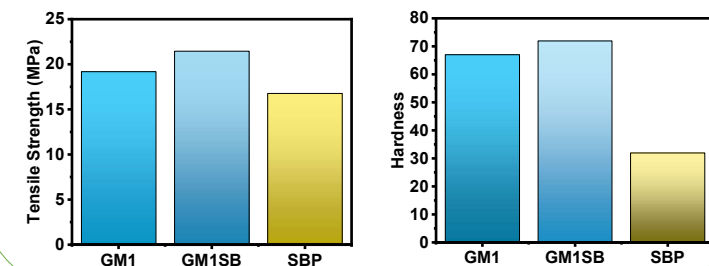
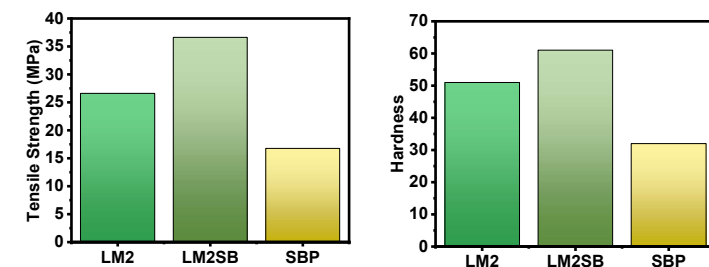
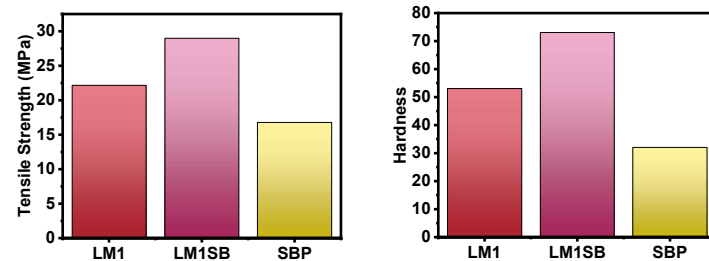
Experiment

Reaction Scheme :-



Results

Hardness Test and Tensile Strength



Conclusions

- Thiols from limonene and geraniol were successfully synthesis using thiol-ene click reaction.
- Upon addition of soyabean polyol in thiols while reacting with MDI hardness of the film increases.
- Also, introduction soyabean polyol increases tensile strength.

Acknowledgement

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