Polythiophenes are effective organic semiconductors because they are non-corrosive, easily synthesized, conveniently modified, and have lower manufacturing costs compared to silicon-based solar cells. Doubly-polymerizable thiophene monomers are preferred to traditional polythiophenes because they avoid synthetic challenges that lead to negative impacts in electrochemical properties. The synthesis of novel doubly-polymerizable thiophene monomers will lead to a variety of conducting organic polymers. Thus far, a 3-carboxylic-terthiophene monomer has been synthesized, and an esterification has resulted in a thiophene substituted poly-norbornylene. These methods will work toward uncovering the reliability of organic polymers with a thiophene framework in the production and use of photovoltaic cells.

Current Progress

Monomer 1 in CDCl3

- Shows proton to carbon correlation
- CH$_2$ (geminal) shown in red
- CH shown in black
- Shows carbons directly attached to proton

Conclusion/Future Work

- Synthesize and characterize Monomer 3
- Characterize Polymer A using CV and UV-vis.
- Synthesize and characterize Polymer B

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