Olefin metathesis is one of the most widely used methods for the formation of a carbon-carbon double bonds. Using highly active catalysts, the accessibility of metathesis has broadened to other areas of research. Acyclic diene metathesis (ADMET) polymerization has been extensively used in the synthesis of precise homopolymers by using well-defined monomers to form unique polymer morphologies with intriguing physical properties.\(^{(1)}\) Traditional ADMET polymerization cannot be used to make block polymers, since it includes reactive internal olefin bonds on the polymer backbone. The presence of a second monomer will lead to insertion and form a statistical copolymer. Due to this limitation, precise block polymers synthesized by metathesis have yet to be studied in detail.\(^{(2)}\) Selective acyclic diene metathesis (SADMET) polymerization synthesizes a polymer with non-reactive backbone double bonds by sequentially reacting electron deficient \(\alpha,\omega\)-dienes with electron rich \(\alpha,\omega\)-dienes to form block and alternating polymers.\(^{(3)}\) To date, only acrylates have been widely utilized in SADMET polymerizations.\(^{(4)}\) Our work focuses on incorporating new functional groups on electron deficient and sterically hindered \(\alpha,\omega\)-dienes to function as monomers that can undergo SADMET polymerization. Alternating and block polymers will be made utilizing these functional groups to synthesize new polymers with precisely placed functional groups.

References:

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