Searching for a New Epoxide Precursor in TMM Cycloaddition Reactions

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In order to explore the feasibility of Pd(0)-catalyzed trimethylenemethane (TMM) cycloaddition reactions with epoxides, the precursor trimethyl-(2-oxiranyl-2-propenyl)-silane (1) was synthesized in a three-step process from propargyl alcohol and reacted with dimethyl malonate, with Pd(PPh3)4 acting as a catalyst, in both THF and toluene. This reaction was performed to examine whether the π-allyl Palladium complex forms and whether the epoxide ring opens. NMR spectra show support for π-allyl Palladium complex formation, the epoxide ring opening, and the presence of the expected product, although the solvent used may affect which product forms. Efforts to characterize the product(s) are ongoing.

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Christopher Miko is a senior physics and chemistry major at Valpo. He plans on going to graduate school for physics and will begin serving on active duty in the U.S. Air Force after graduating.

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