

## Spotlights on Recent JACS Publications

## ■ A SILICON VERSION OF A METATHESIS INTERMEDIATE

An olefin metathesis reaction starts with two carbon–carbon double bonds, snips each alkene in half, and then reconnects the double bond. The new molecule contains pieces from each of the starting molecules and is constructed via a metallacyclobutane intermediate. Vladimir Ya. Lee, Akira Sekiguchi, and their colleagues have built a titanium silylene complex that performs this same cycloaddition chemistry (DOI: 10.1021/ja401072j).

In olefin metathesis, the metallacyclobutane intermediate is formed from the [2+2] cycloaddition of an alkene to a transition metal carbene complex. Silicon forms a similar cyclic complex, but these cycloadducts are unable to undergo subsequent cycloreversion and further react with an alkene to perform a complete olefin metathesis reaction. The newly synthesized silatitanacyclobutenes are stable up to 100 °C, and now the researchers are looking for starting materials—including alkenes—that might be able to complete the metathesis cycle.

Olefin metathesis is an important industrial transition metal-catalyzed reaction. For example, in petroleum refining, metallacyclobutane-mediated reactions are used to make substituted double bonds from molecules that have alkenes dangling at the end of a chain. The researchers suggest that the new titanium silylene-derived catalyst might lead to the development of novel organosilicon materials, which can be used in coatings, lubricants, and surfactants.

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