Chem 343 – Organic Reactions
Chapter 9
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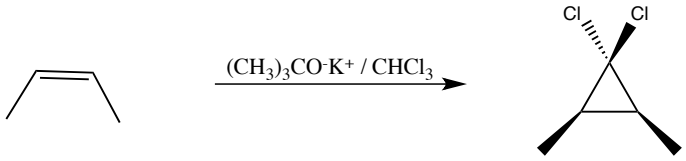
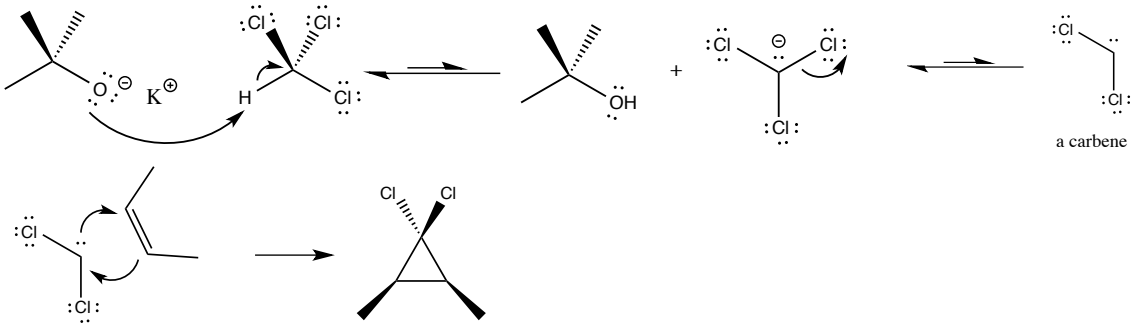
http: www.chem.wisc.edu/areas /clc (Resource page)

Synthesis and Reactions of Carbenes and Carbinoids

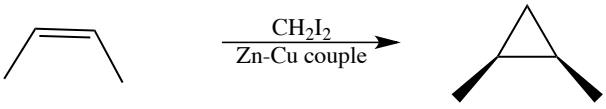


Mechanism

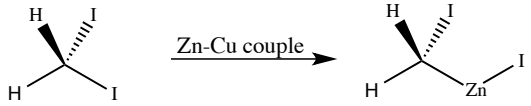


This reaction requires the formation of a *carbene*. It's a carbon compound that lacks an octet, therefore, is *electron-deficient* . In the presence of an alkene a dihalocyclopropane derivative is formed. They are chemically very reactive so the equilibrium will favor their formation as they are consumed. The reaction is stereospecific. The product is the result of a concerted *syn*-addition.

The Simmons-Smith Reaction

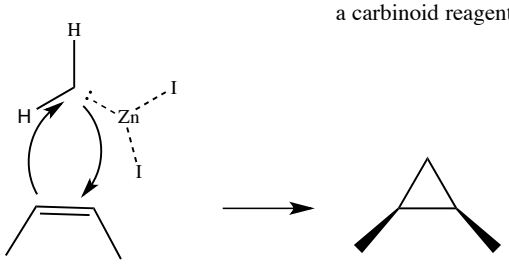


Mechanism



Simmons-Smith reagent

a carbinoid reagent



The Simmons-Smith reaction has a coordinated methylene compound that acts like a carbene – they are not free carbene species; thus termed a *carbinoid*. The product of the reaction is a cyclopropane derivative. This reaction is a stereospecific, concerted *syn*-addition.