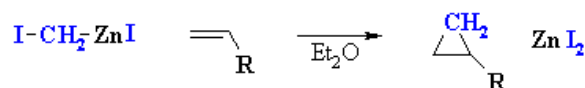
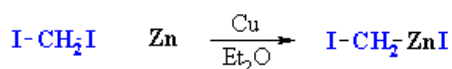


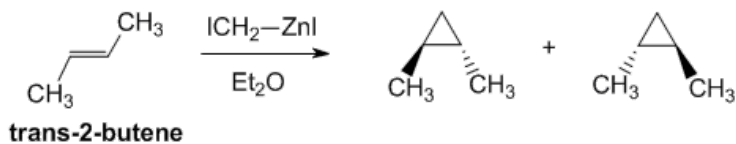
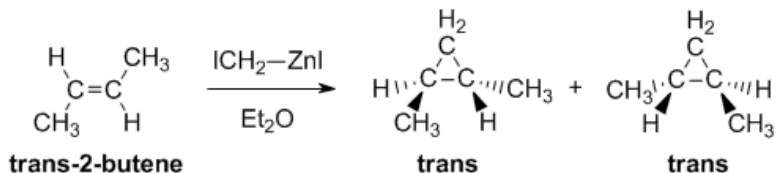
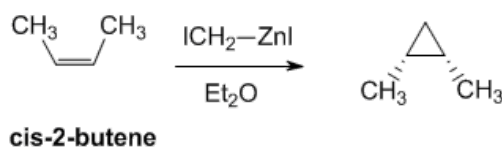
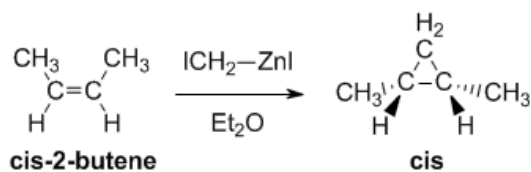
Synthesis of Cyclopropanes using RZnX (The Simmons-Smith reaction)



Reaction type: 1. Oxidation-Reduction, 2. Addition

Summary

- This is the most important reaction involving an organozinc reagent.
- Also known as the Simmons-Smith reaction
- The iodomethyl zinc iodide is usually prepared using Zn activated with Cu.
- The iodomethyl zinc iodide reacts with an alkene to give a cyclopropane.
- The reaction is stereospecific with respect to the alkene (mechanism is concerted).
- For example if the alkyl groups of the alkene are *cis*- then they are also *cis*- in the cyclopropane and *trans*-alkenes give *trans*-cyclopropanes:



Related reactions

- [Addition reactions of alkenes](#) (Ch 6)

MECHANISM OF THE SIMMONS-SMITH REACTION

Step 1:

A concerted reaction : both new C-C are formed simultaneously. Best viewed as the nucleophilic C=C causing loss of the iodide leaving group and the electrons from the nucleophilic C-Zn bond being used to form the other C-C bond.

