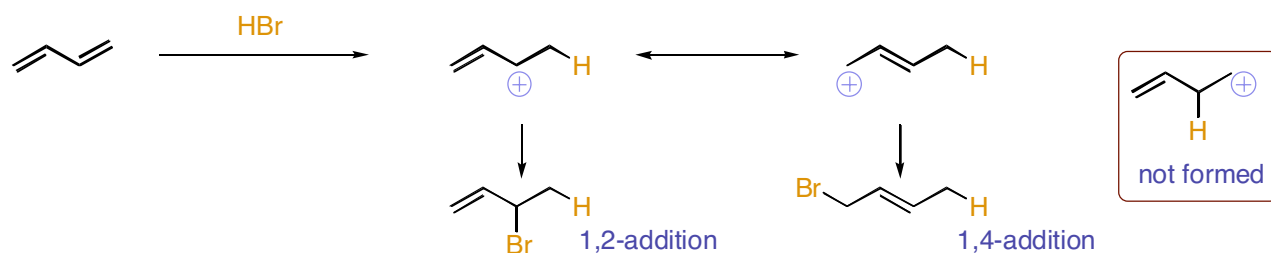


These notes can be obtained at: <http://www.ndsu.nodak.edu/instruct/grcook/chem342/notes.shtml>

Chapter 14: Conjugated Dienes and UV Spectroscopy

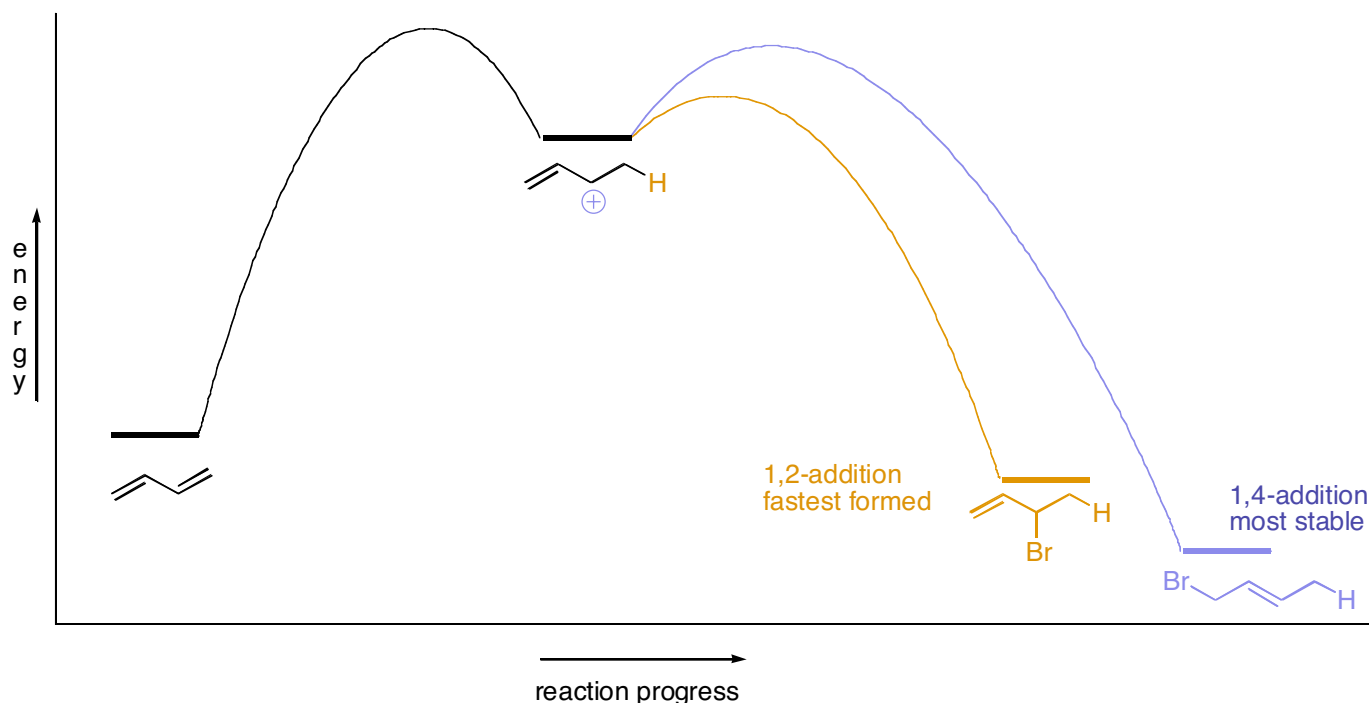
Reactions of conjugated diene

Conjugated dienes react with electrophiles to form the product of the most stable carbocation intermediate. Since the carbocation is allylic, the nucleophile can add to two different carbons to afford the 1,2-product or the 1,4-product. Usually a mixture is obtained.



Kinetic Control	0 °C	71%	29%
Thermodynamic Control	40 °C	15%	85%

Product ratios can be controlled by the kinetics (which one forms faster, non-reversible, low temp) or the thermodynamics (which one is more stable, reversible, higher temp).



Diels-Alder Cycloaddition Reaction

The Diels-Alder cycloaddition involves the reaction of a conjugated diene and an alkene to form a new 6-membered ring. The reaction works best if the diene is electron rich and the dienophile is electron poor (contains an electron withdrawing group (EWG)). The reaction occurs in one step through a cyclic transition state. The reaction is stereospecific with regards to the dienophile stereochemistry. A cis-alkene will afford a cis-product and a trans-alkene will afford a trans-product.

