

Summary

- Alkenes and alkynes that are substituted with electron-withdrawing groups such as carbonyl, nitro, or sulfonyl groups are electrophilic. Many nucleophiles react with these alkenes to give conjugate addition (i.e., 1,4-addition) products.
- The enol resulting from 1,4-addition undergoes spontaneous tautomerization to give alkene addition as the net result.
- Nucleophiles that are weak bases such as alcohols, thiols, amines, and halides, add reversibly to α,β -unsaturated carbonyls and tend to give the thermodynamic product (i.e., typically the product of conjugate addition). Nucleophiles that are strong bases add irreversibly and give direct addition (i.e., 1,2-addition) products.

1,2- vs. 1,4-Additions to α,β -Unsaturated Carbonyl Compounds

