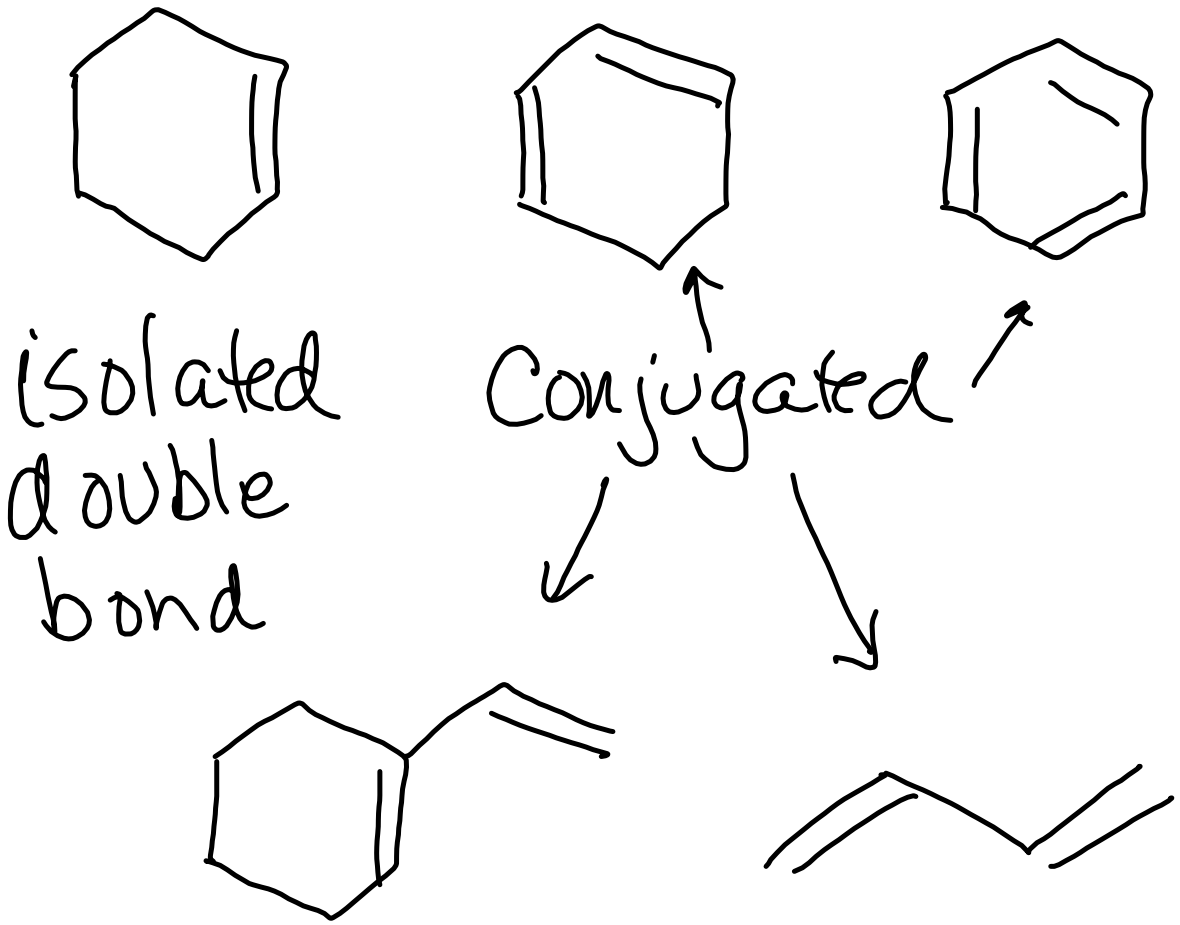
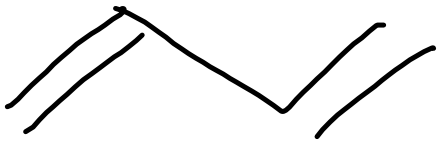
Chpt 14

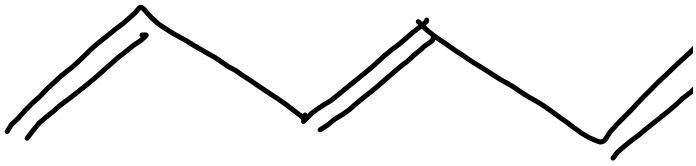
Conjugated Cmpds



Conjugation creates stability

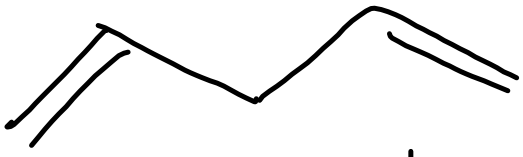


2

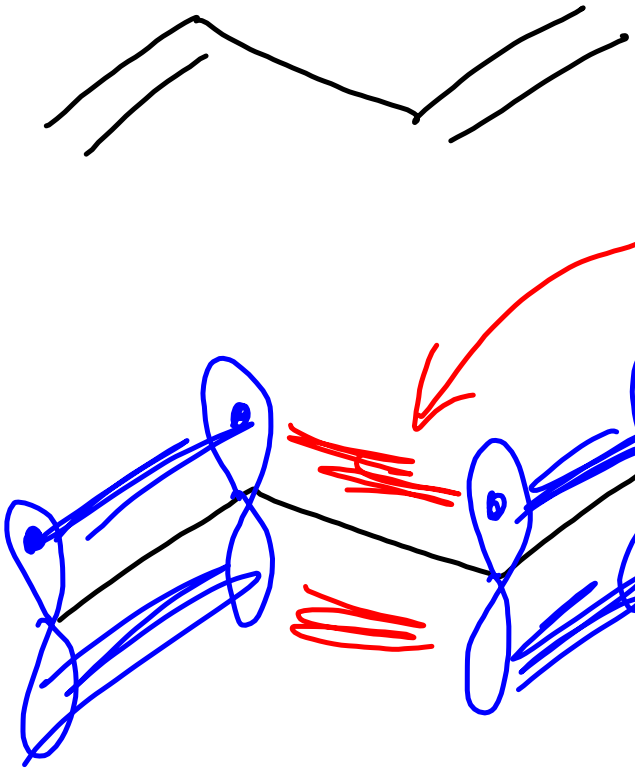


most stable

1



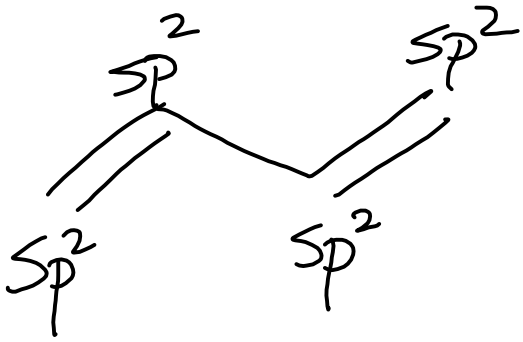
3 least stable (isolated)



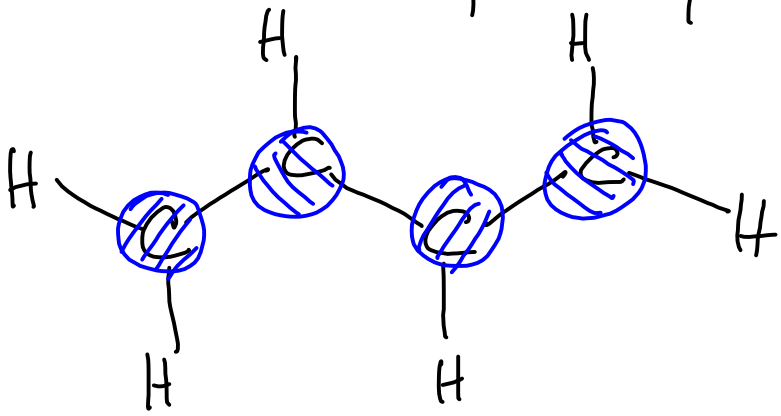
Single bond normally 1.5 Å

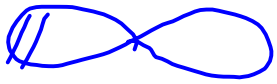
double " 1.3

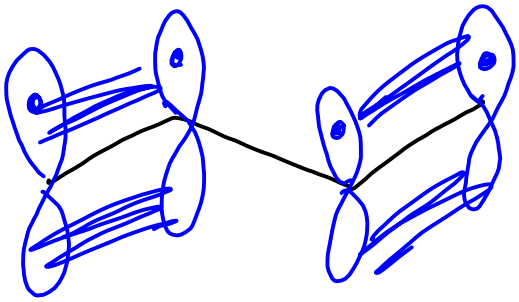
triple bond " 1.1



All C's trigonal planar



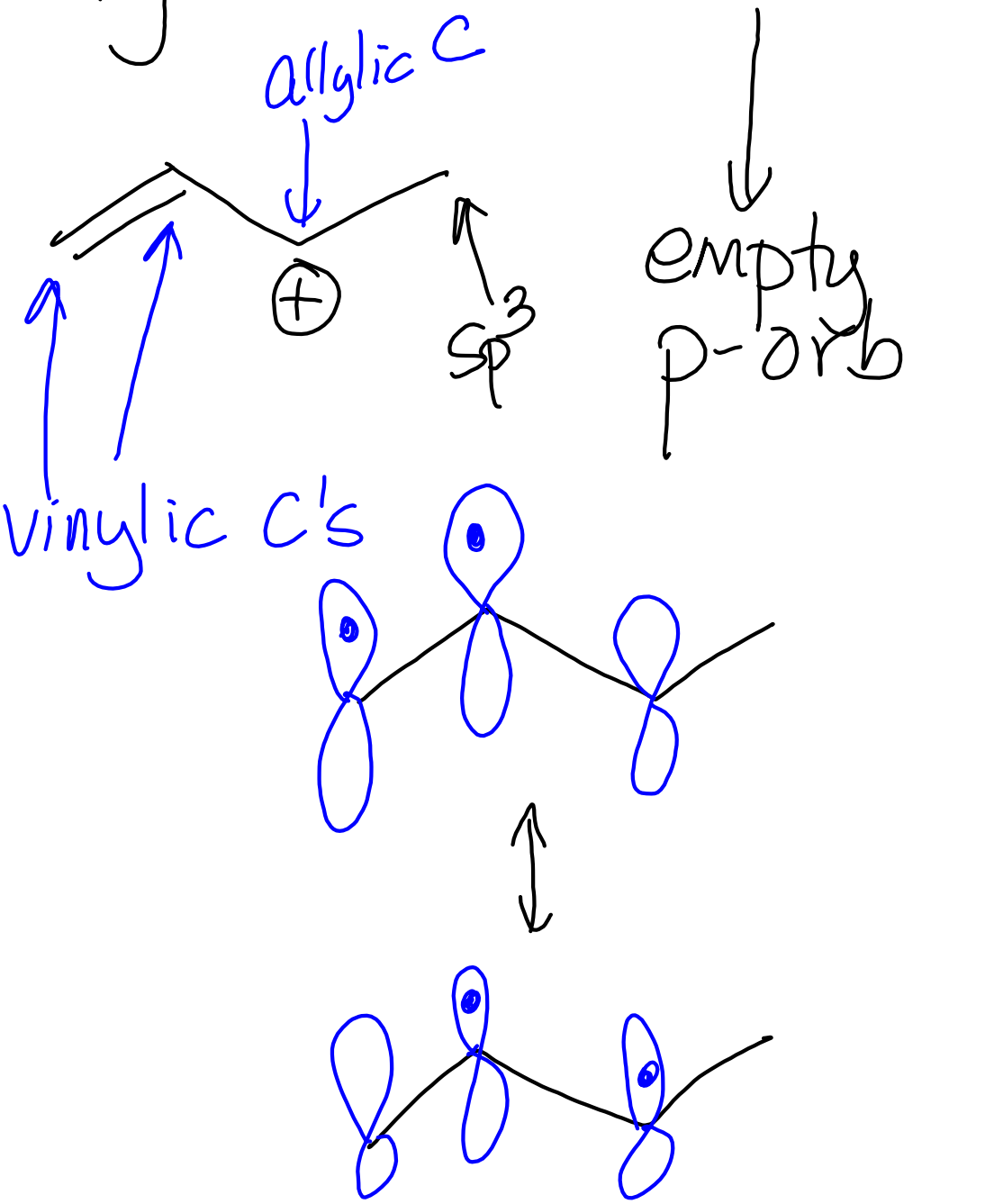


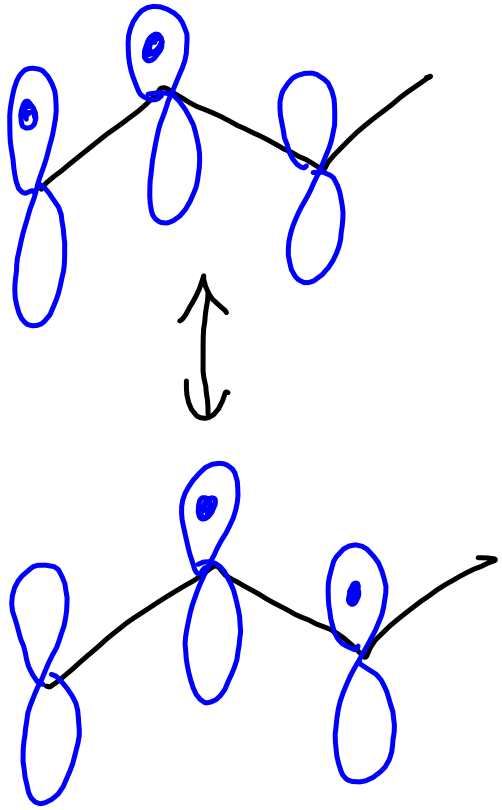


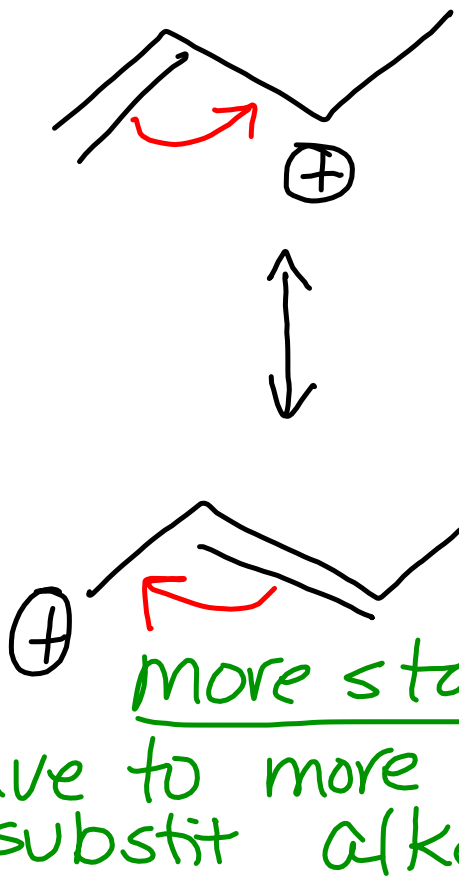
Side View

π-bond is $\perp$ to Plane of C's + H's

Allylic Carbocation

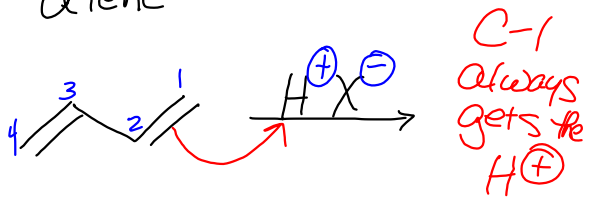


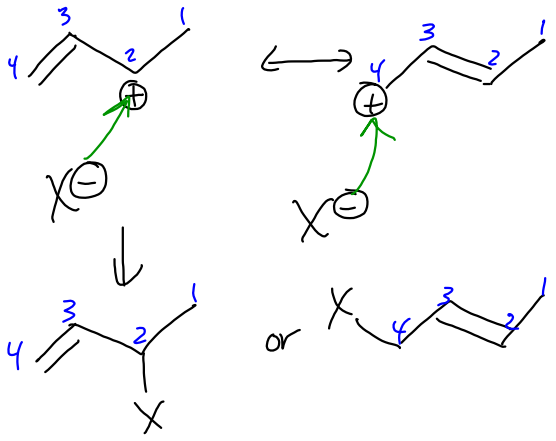




more stable
due to more
substit alkene

Addn of HX to a conj diene





1,2-addn 1,4-addn

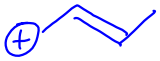
Can control the rxn using temp

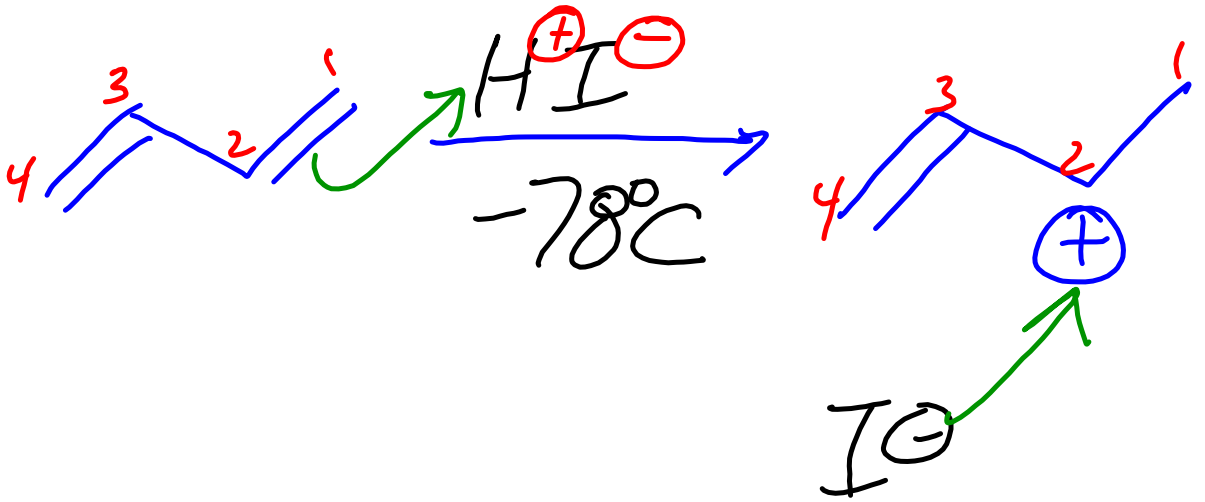
if want 1,2-prod use -78°C

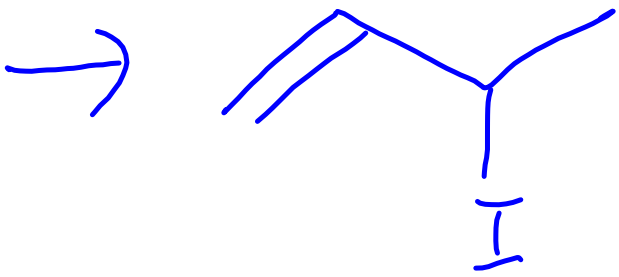
if want 1,4-prod use 50°C

At cold temps – form initial carbocation at C-2 & it reacts

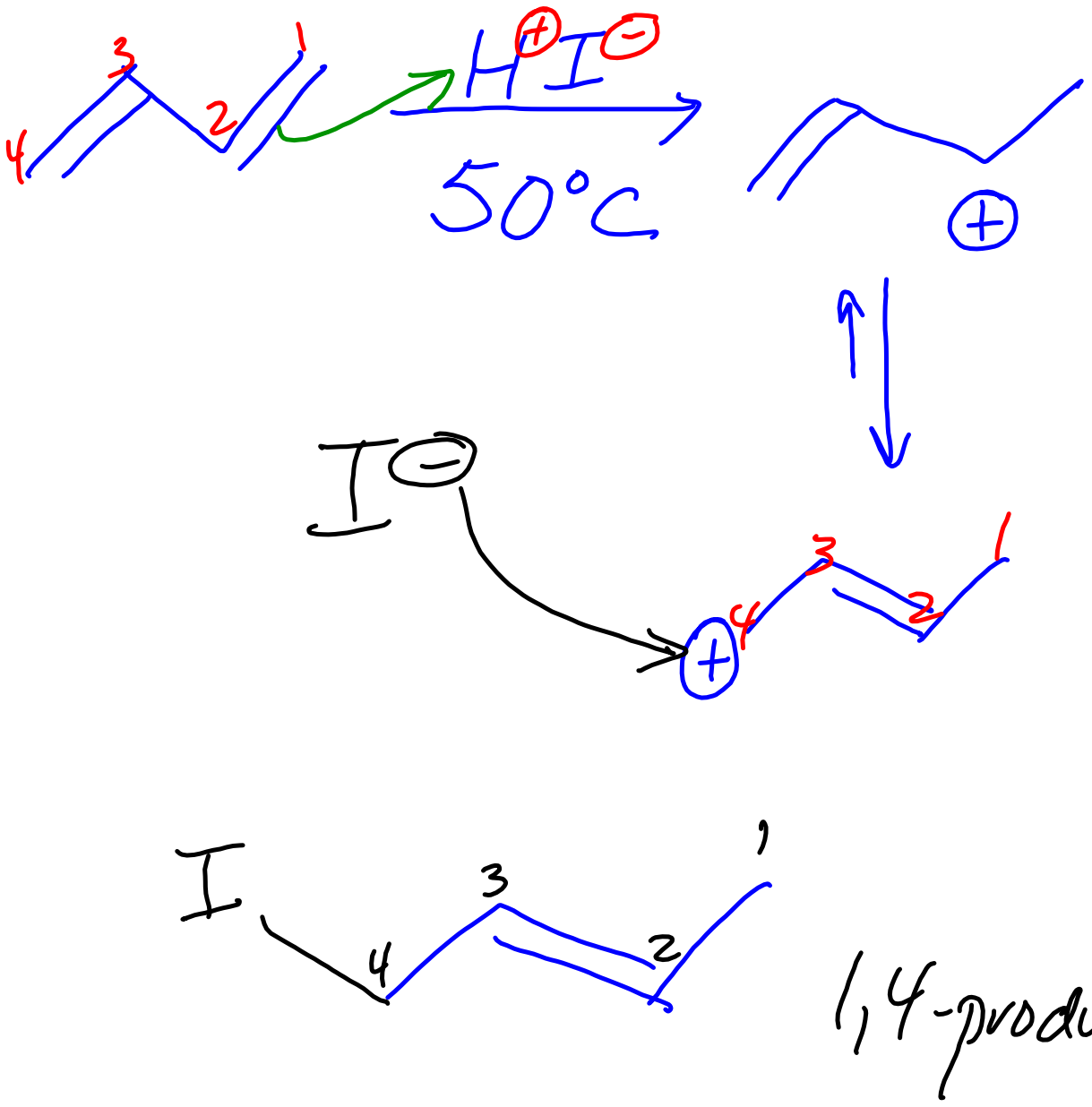
At warm temps – have an equil between the res structures & the more stable one prevails







1,2-product

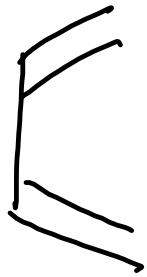


1,4-product

Diels-Alder rxn

[4+2] cycloaddn rxn

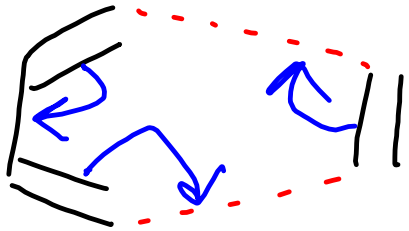
4 πe^- reacting w/ 2 πe^-



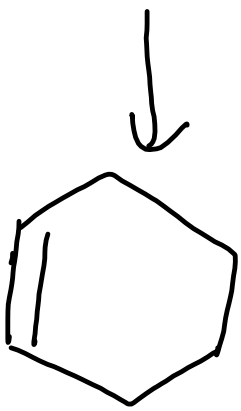
||

ene

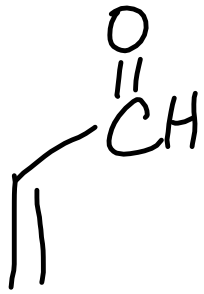
the diene must be "cisoid"



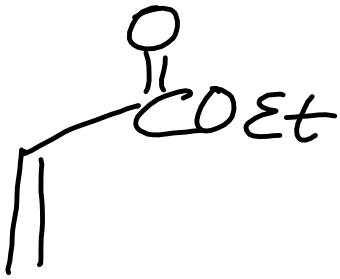
form a cyclohexene ring



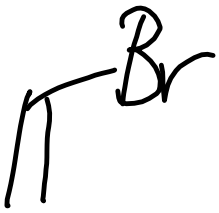
Common alkenes – must have an e⁻ w/drawing group



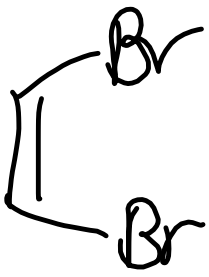
acrolein



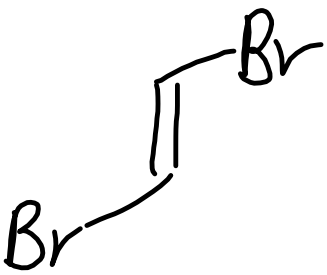
ethyl acrylate



bromo ethene

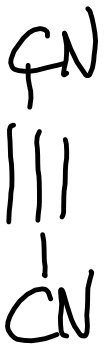


cis dibromo ethene

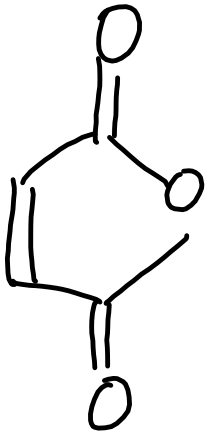


trans dibromo ethene

acrylonitrile

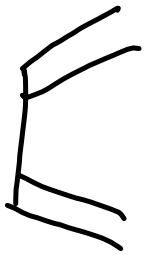


dicyanoethyne

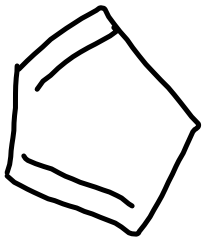


maleic anhydride

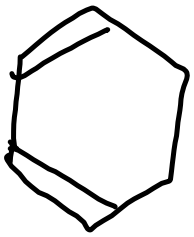
Common dienes:



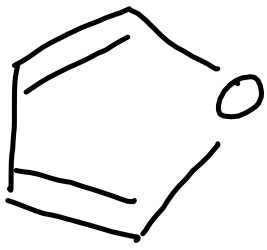
butadiene



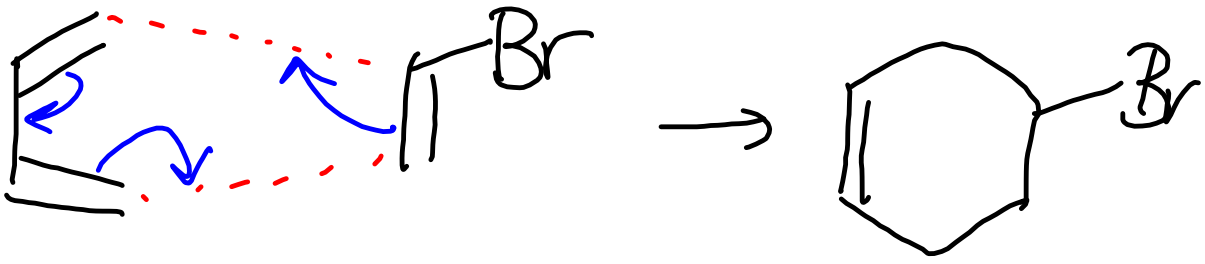
cyclopenta diene

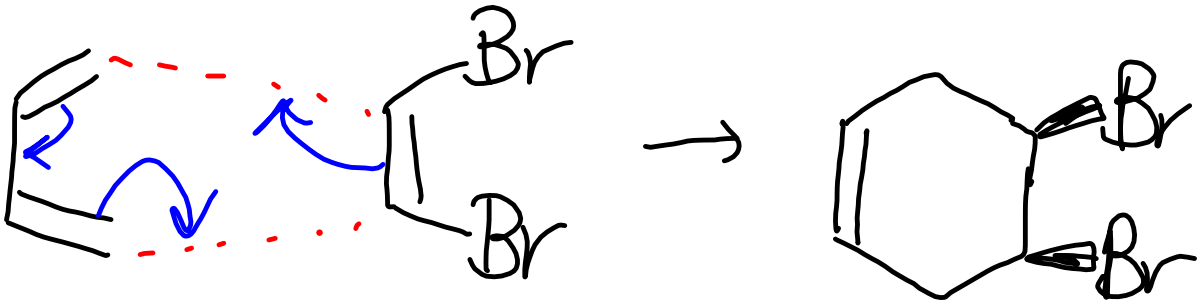


1,3-cyclo hexadiene

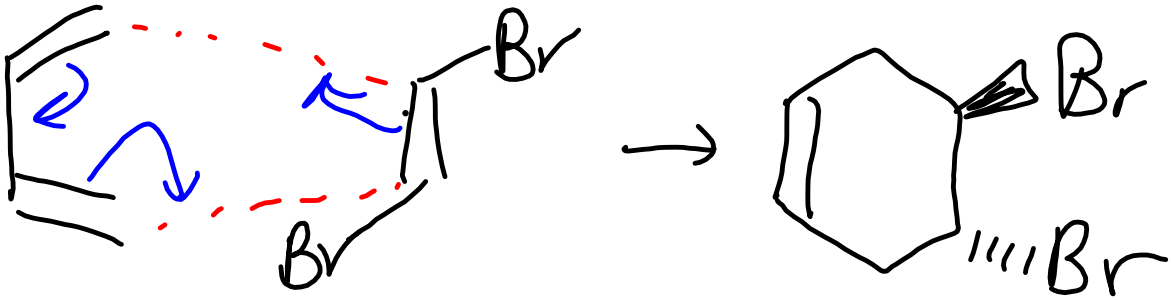


furan

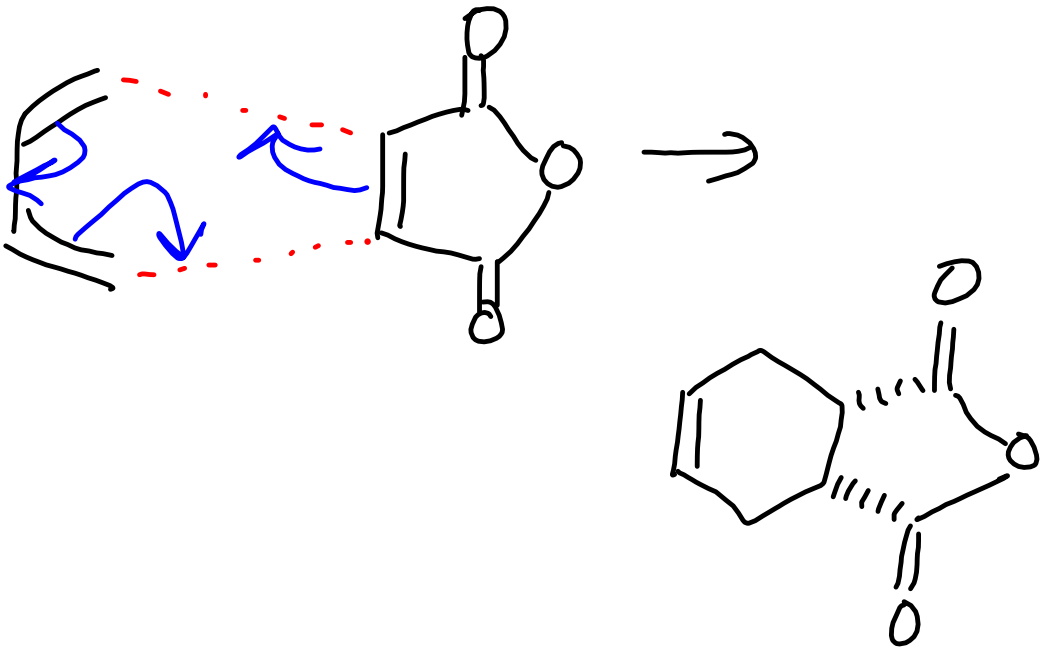


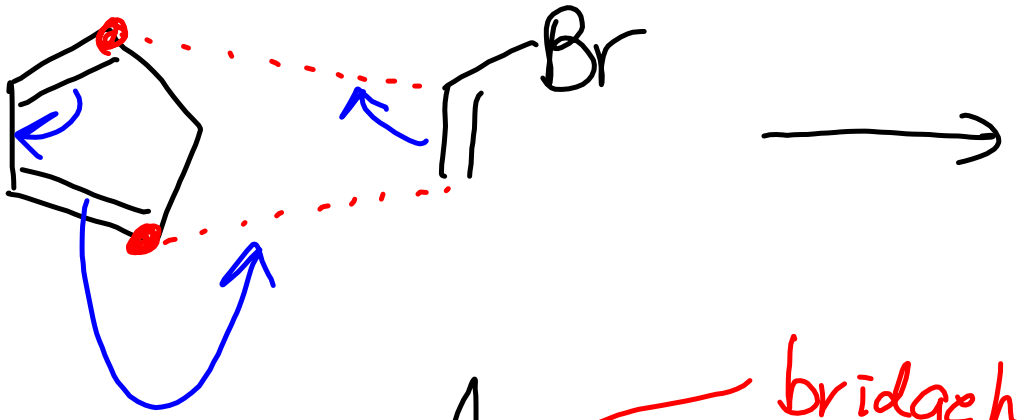


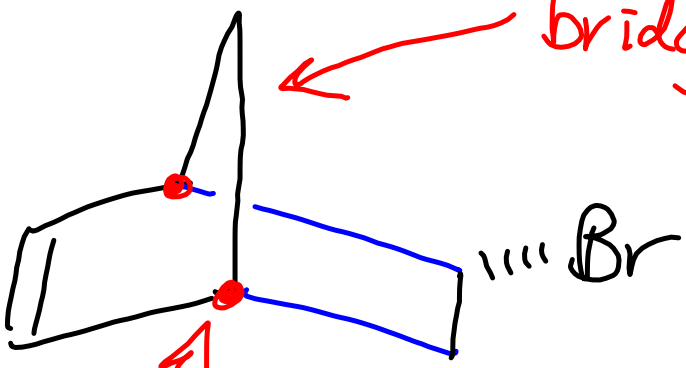
Cis



trans



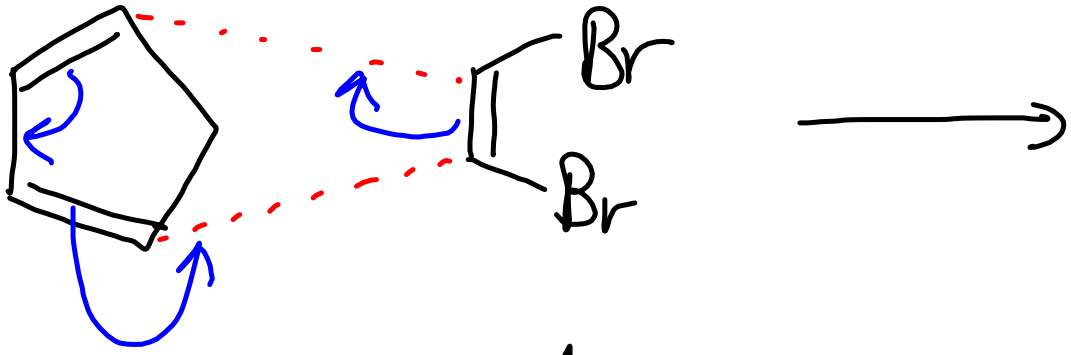


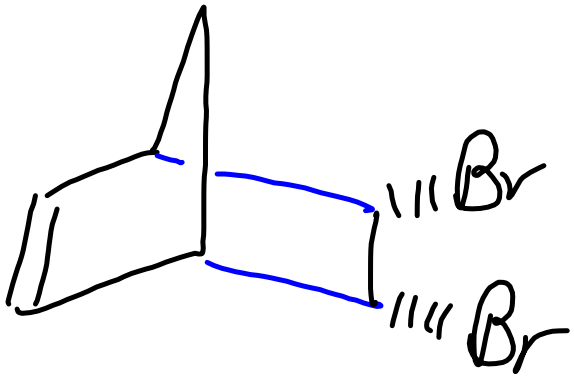


bridgehead

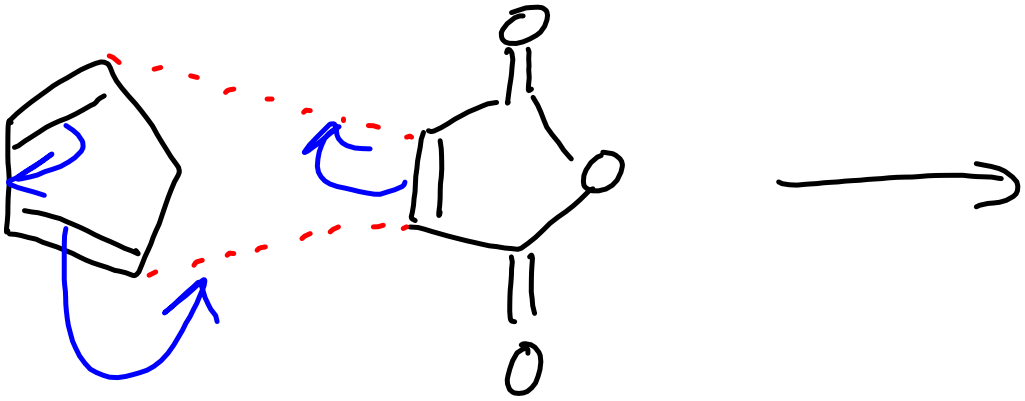
Br is going down (endo)

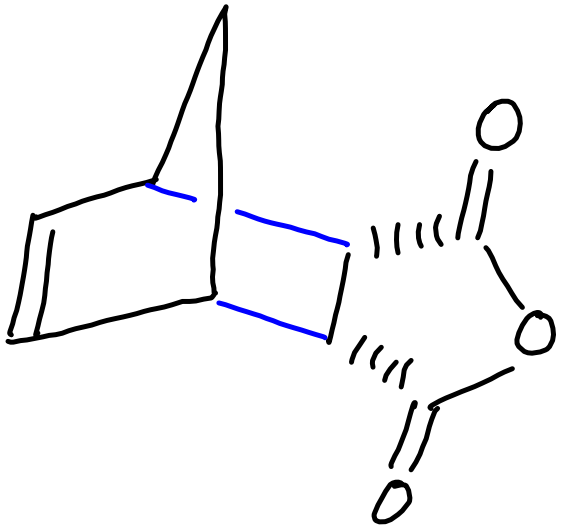
bridgehead Carbons



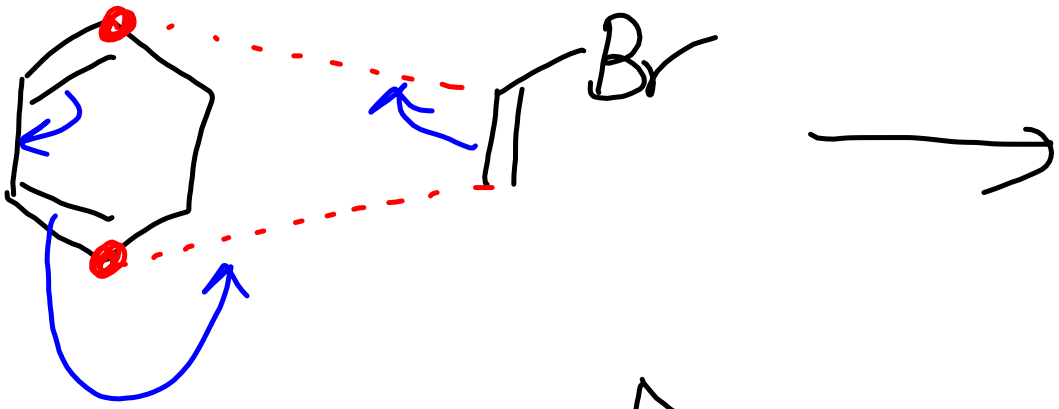


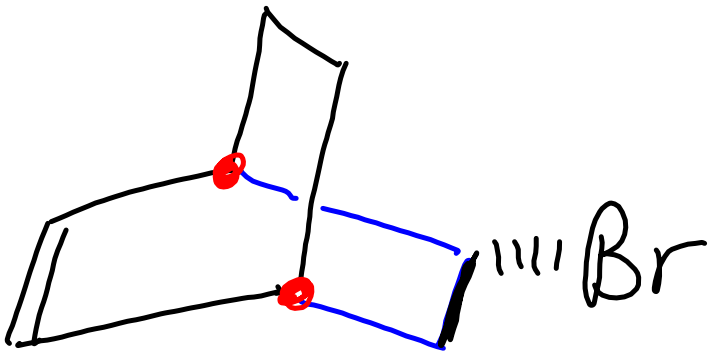
Br's are cis + endo



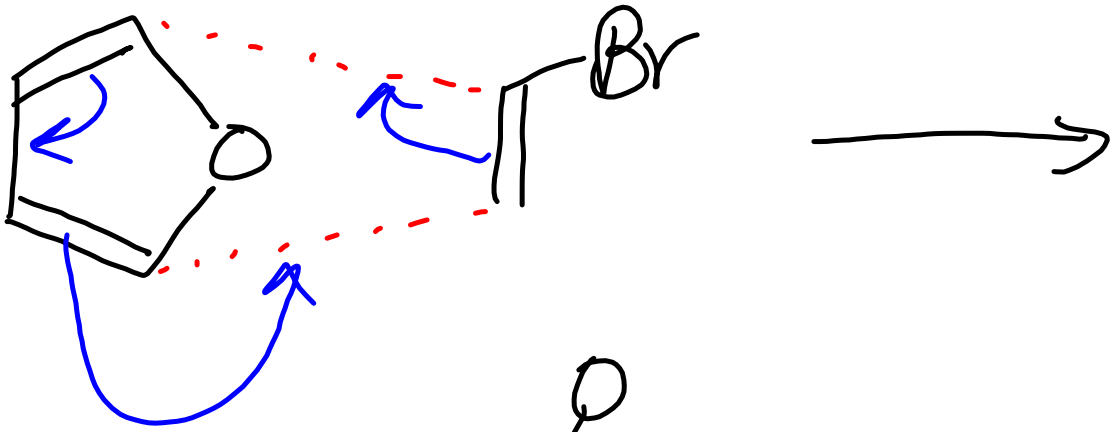


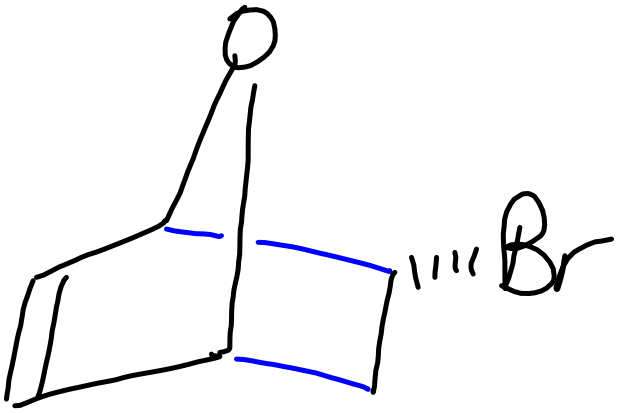
Cis & endo



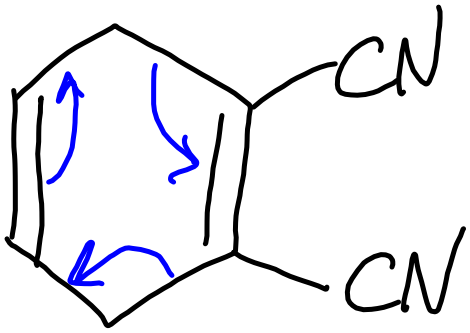


Br is endo





Br endo



What are the sm's

comes from