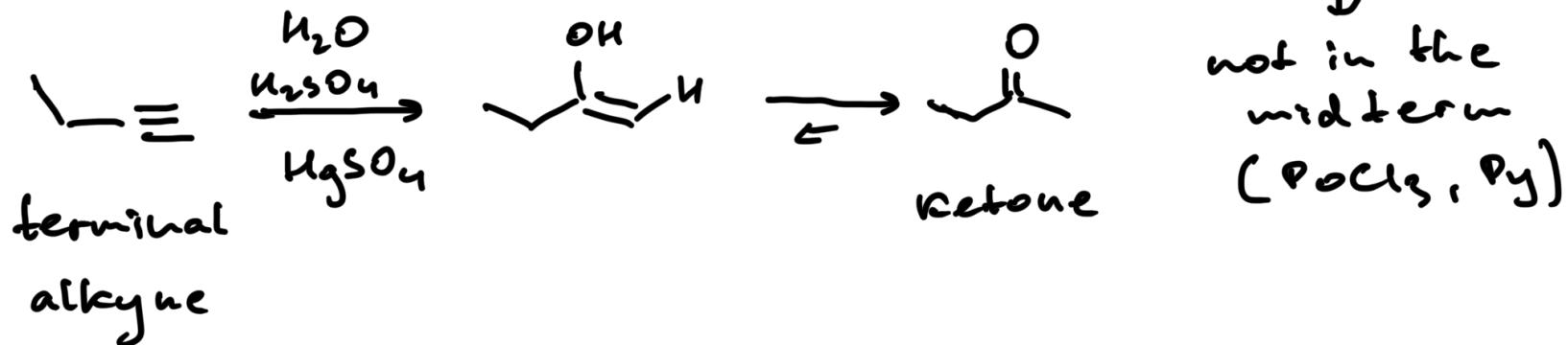


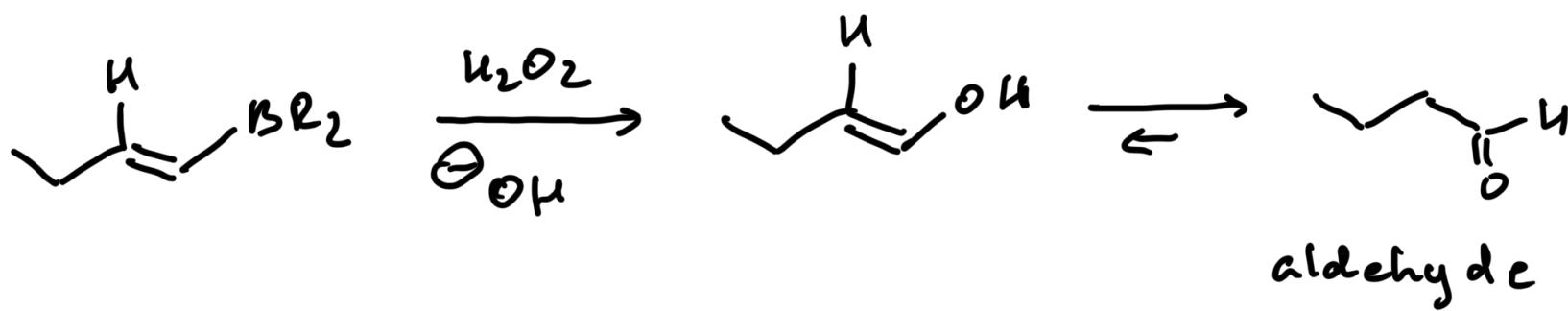
Reactions of alkynes: hydroboration–oxidation

Complimentary methods for hydration of alkynes

Ch. 9.10

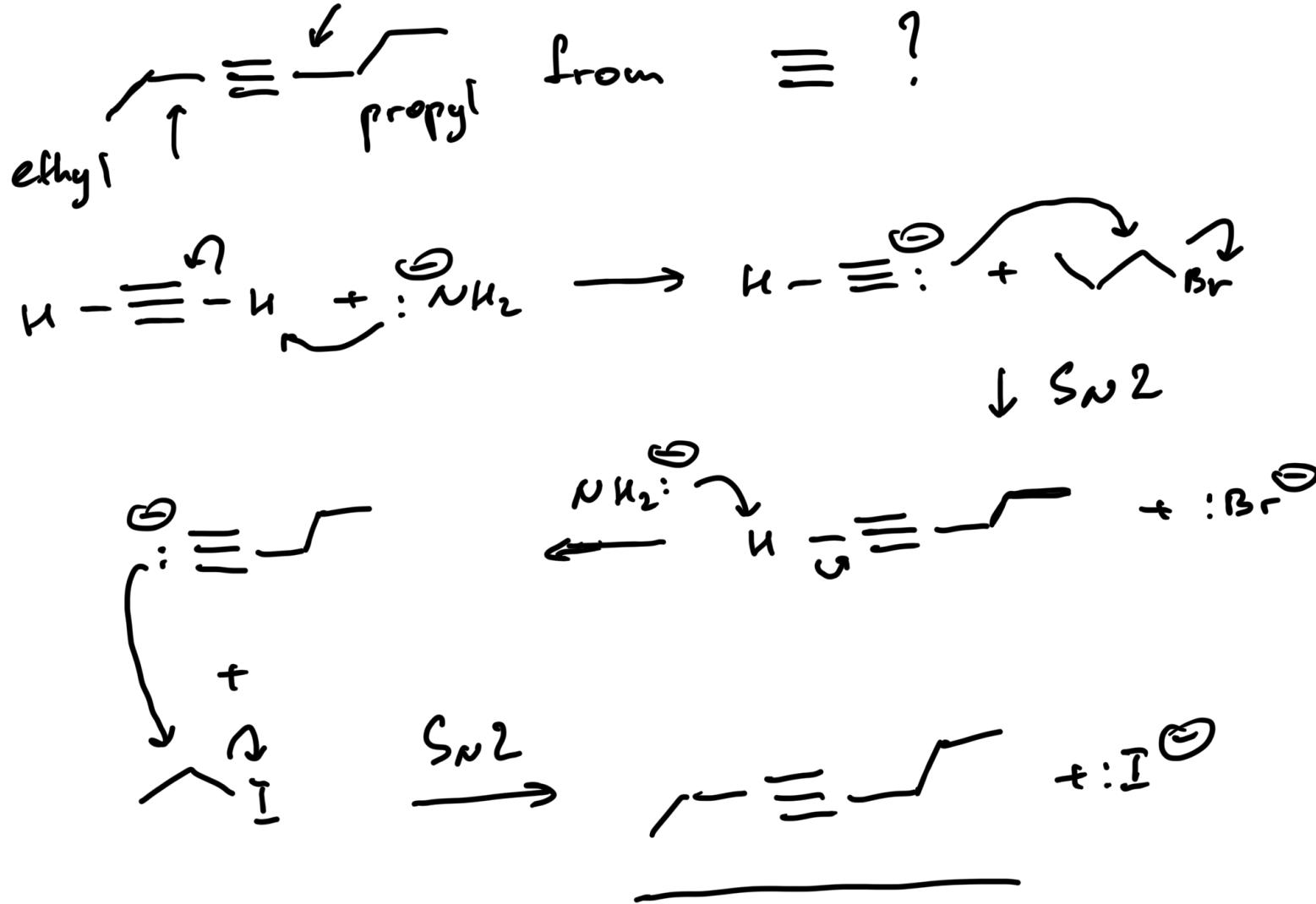


$\downarrow \text{R}_2\text{BH}$



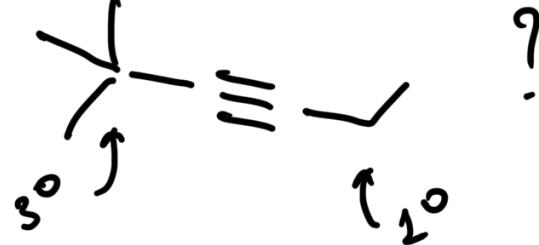
Acetylide anions in synthesis

Nucleophilic substitution: refresh your S_N2/ E2 knowledge

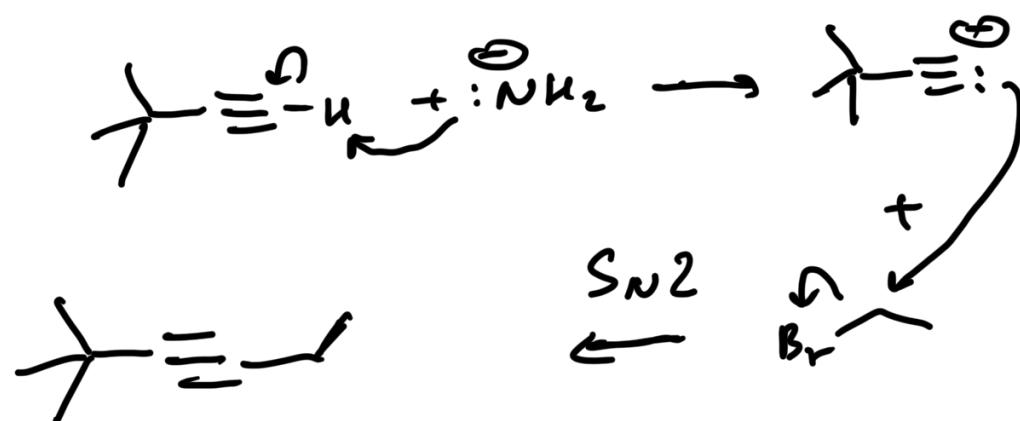


Acetylide anions in synthesis

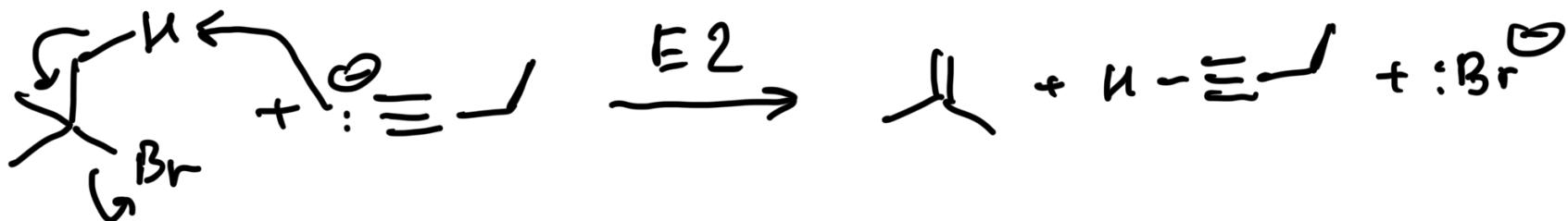
Nucleophilic substitution: refresh your S_N2/ E2 knowledge



sp C and 1° :

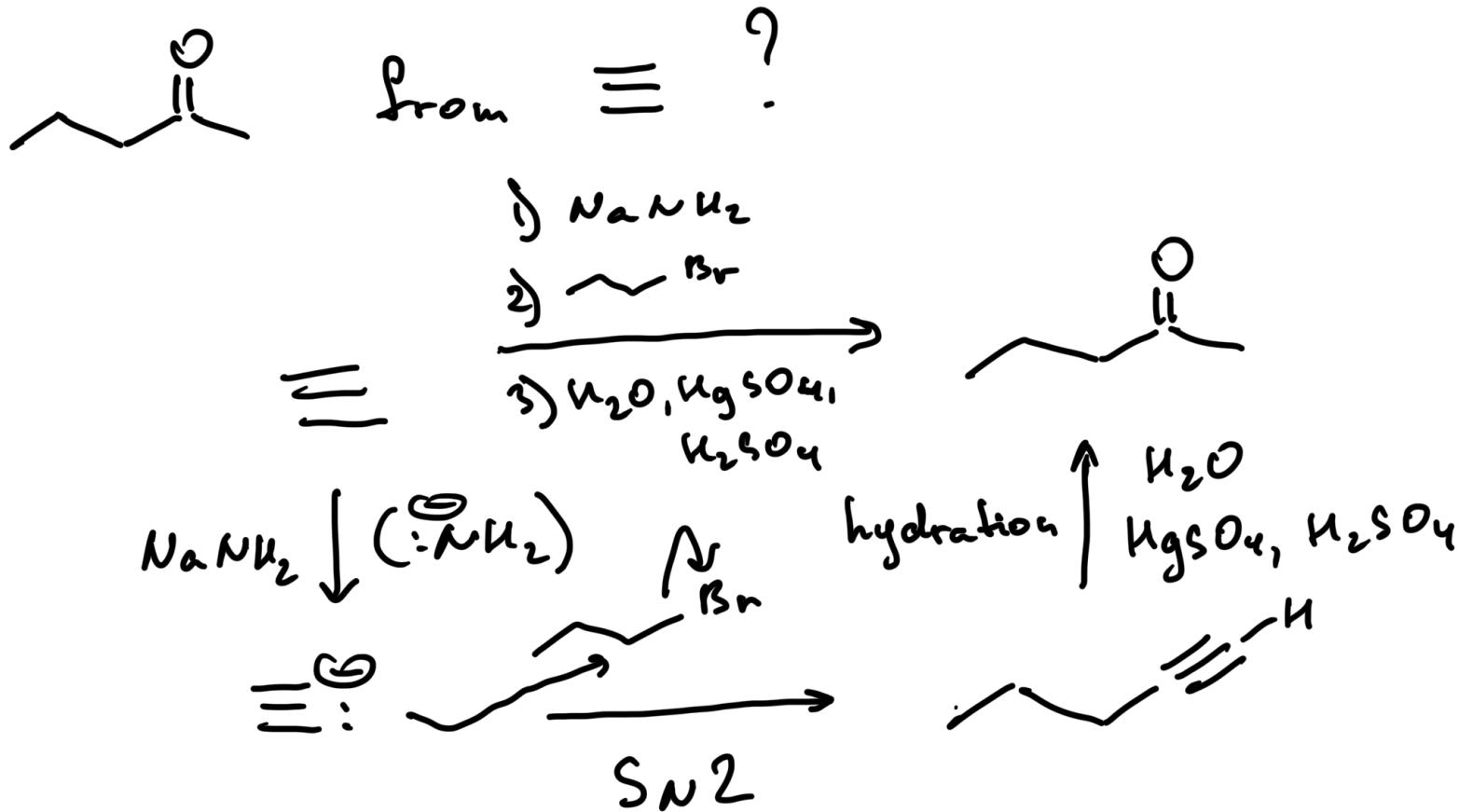


Cannot make bond sp C & 3°:



Alkynes in synthesis

Synthesis of ketones and aldehydes

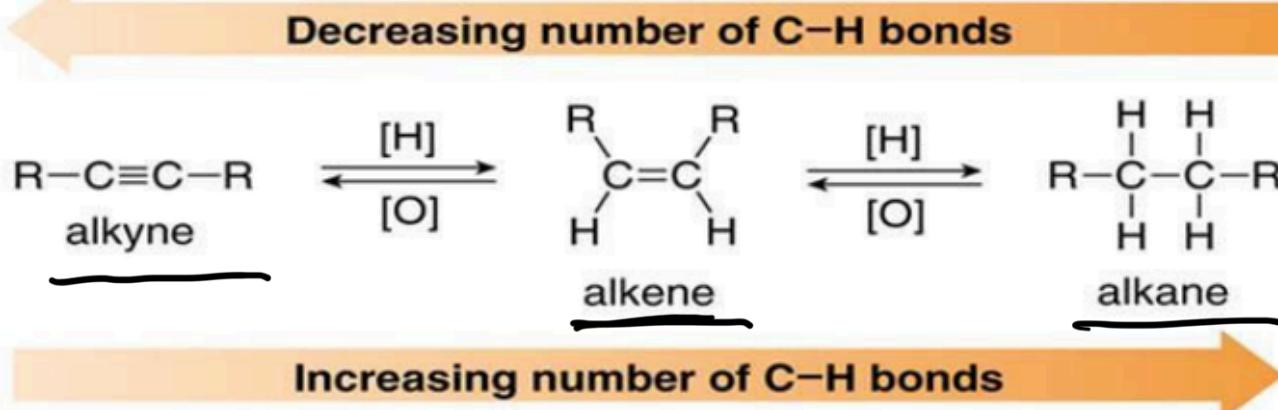
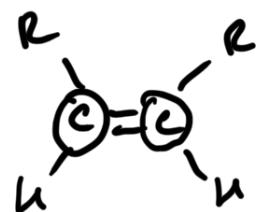
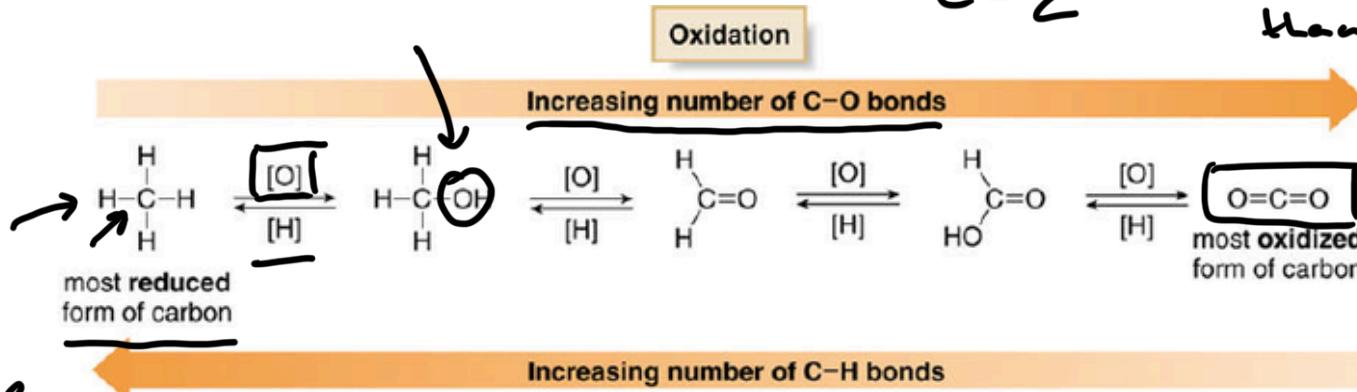


Oxidation and reduction

Defining oxidation and reduction in organic chemistry

C-Z

Z - more e⁻-negative than carbon

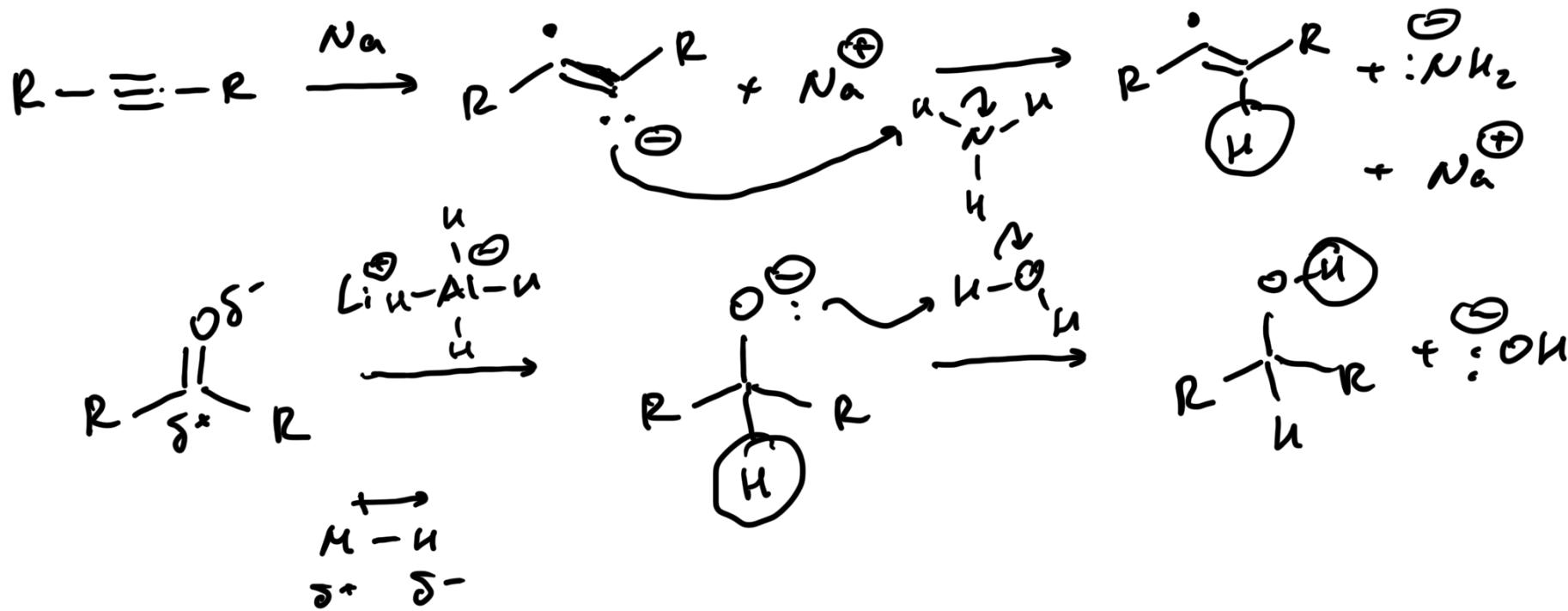
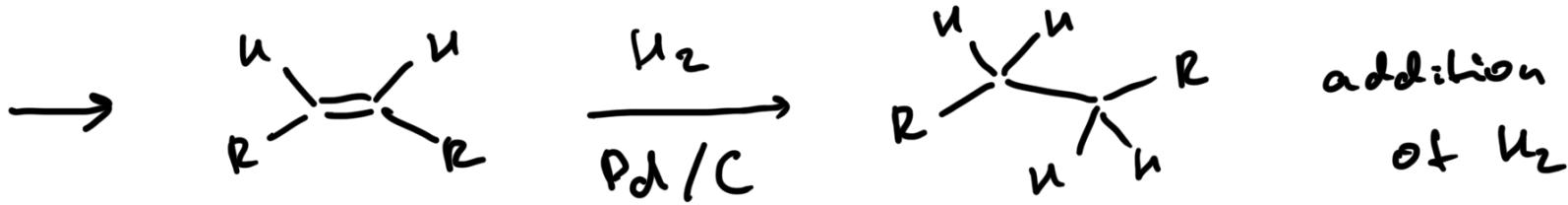


Reduction



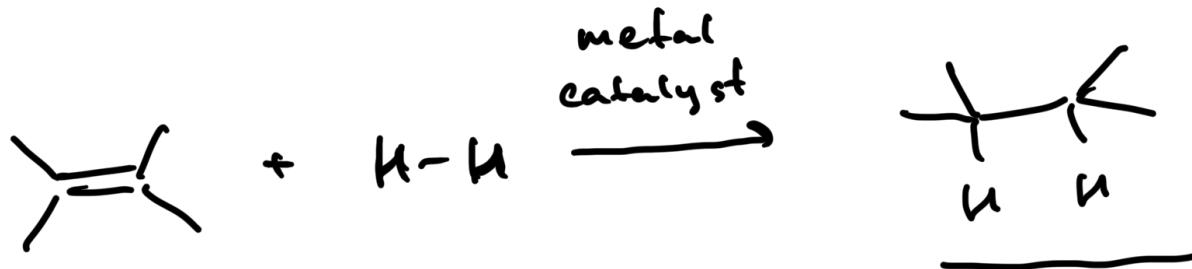
Reduction: reducing agents

Addition of H₂, electron transfers and hydride delivery (followed by protonation)

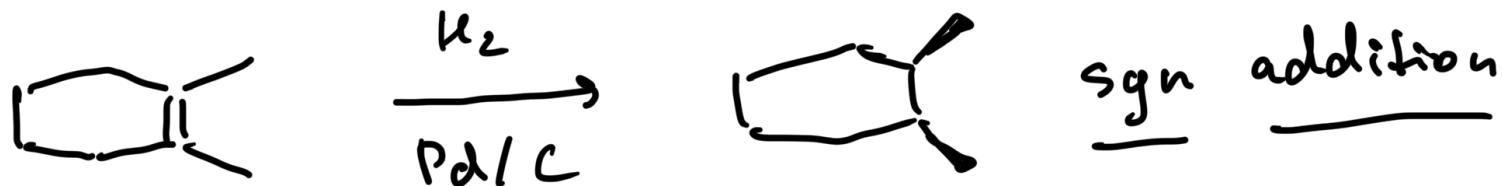


Reduction: hydrogenation of alkenes

General considerations

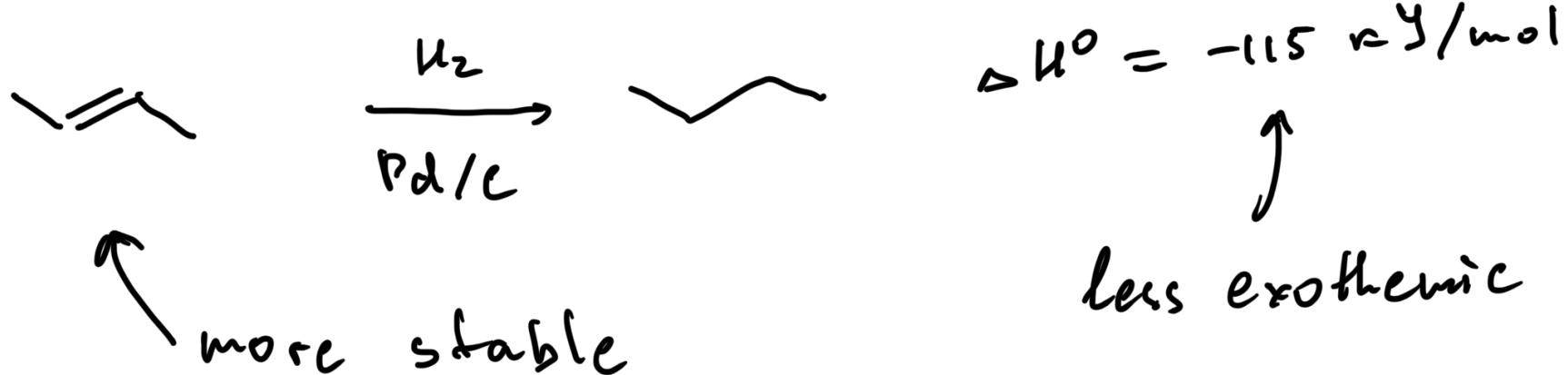
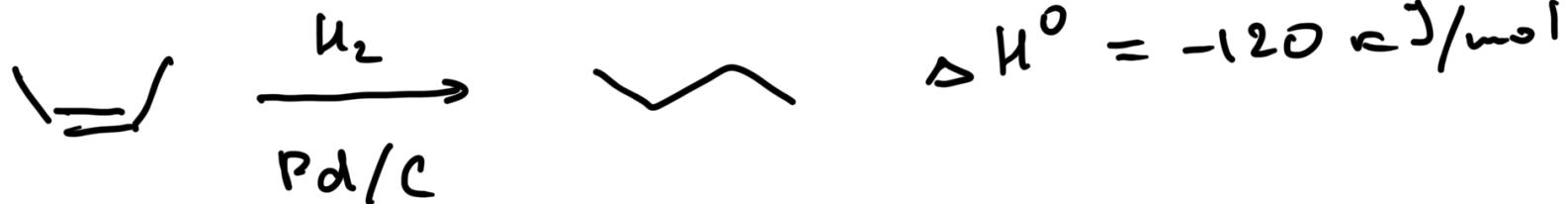


Pd / C → palladium on C
10% 90%



Reduction: hydrogenation of alkenes

Thermodynamics and stability of alkenes

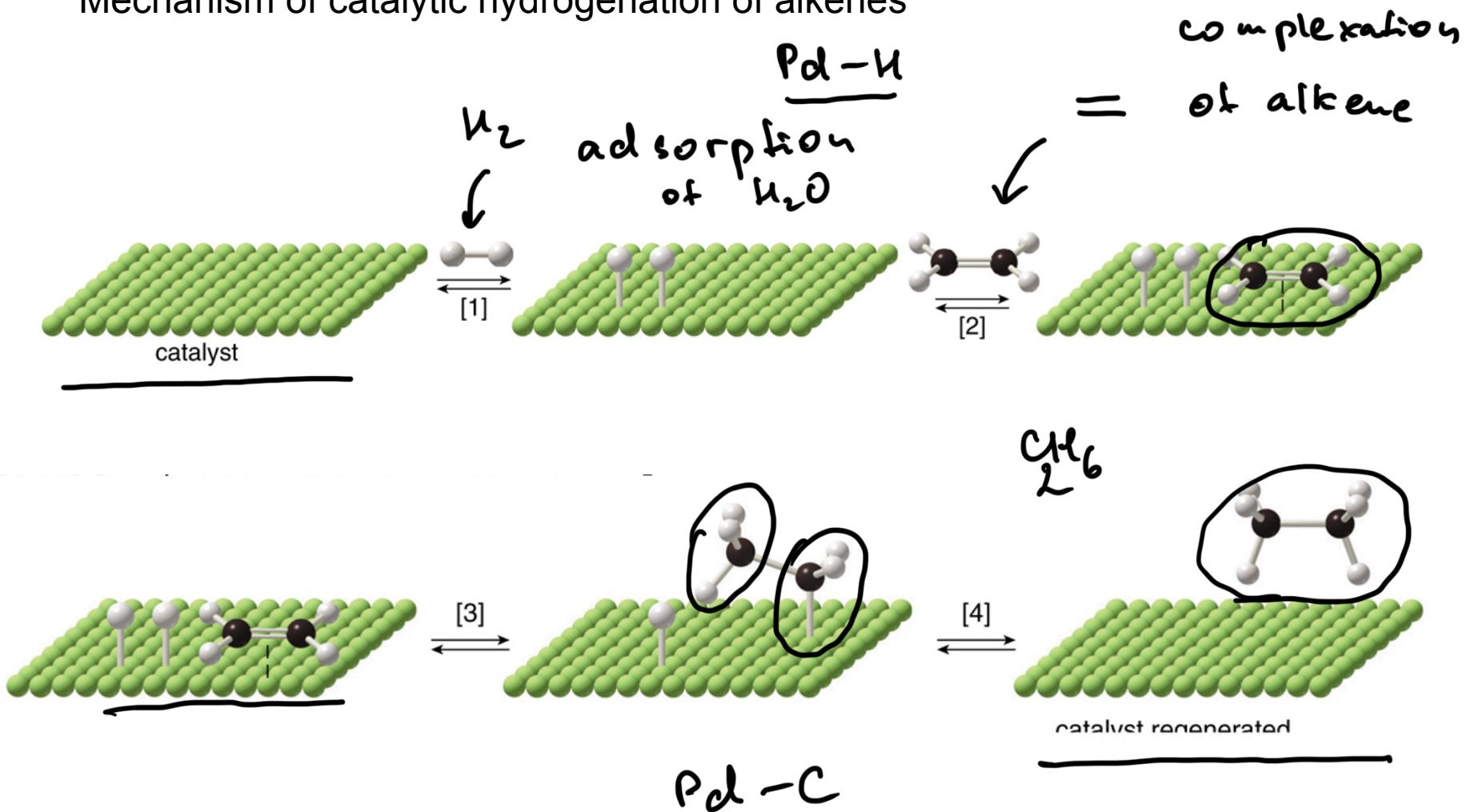


more stable

less exothermic

Reduction: hydrogenation of alkenes

Mechanism of catalytic hydrogenation of alkenes



Reduction: hydrogenation of alkenes

Reactivity trends

Reduction: hydrogenation of alkenes

Hydrogenation and degrees of unsaturation

Reduction: alkynes

Reactivity patterns

Reduction: hydrogenation of alkynes

Reduction to alkanes

Reduction: hydrogenation of alkynes

Reduction to *cis*-alkenes. Lindlar catalyst