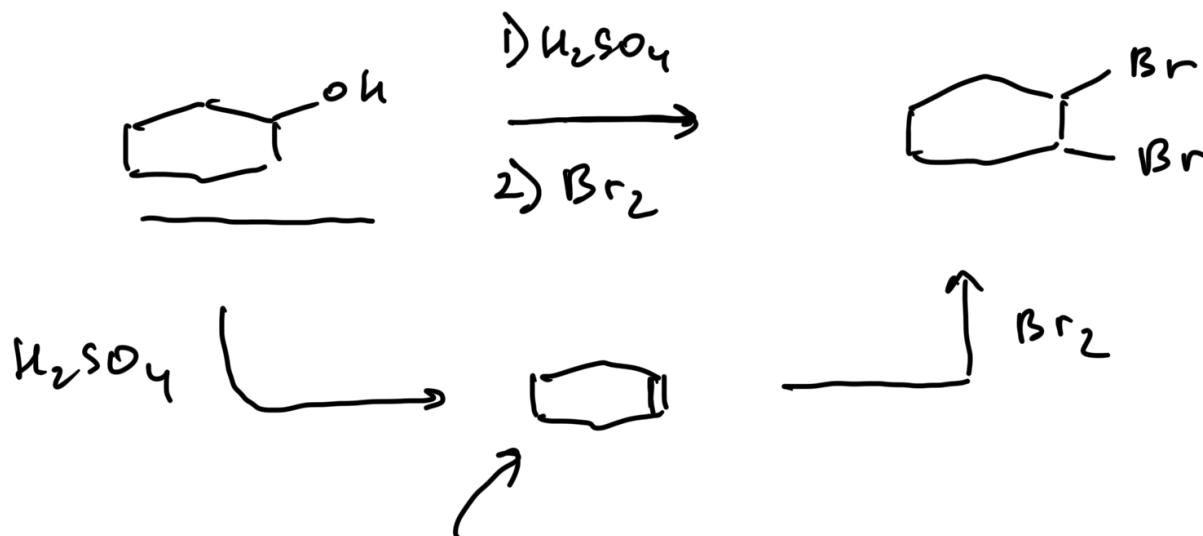
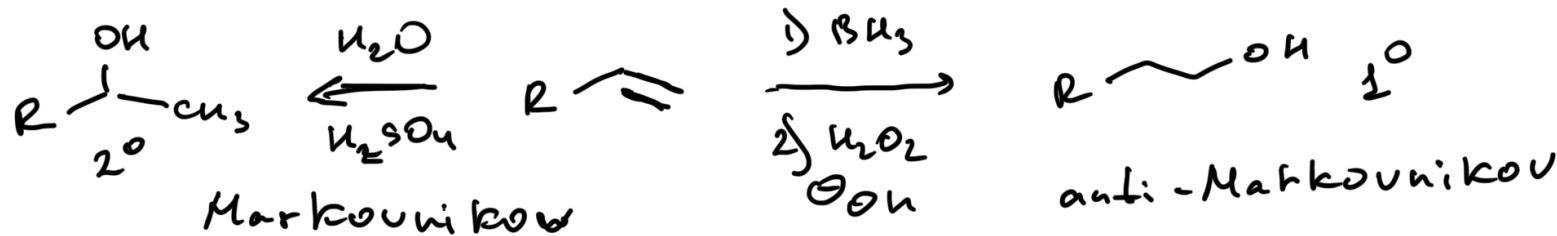


Alkenes in synthesis

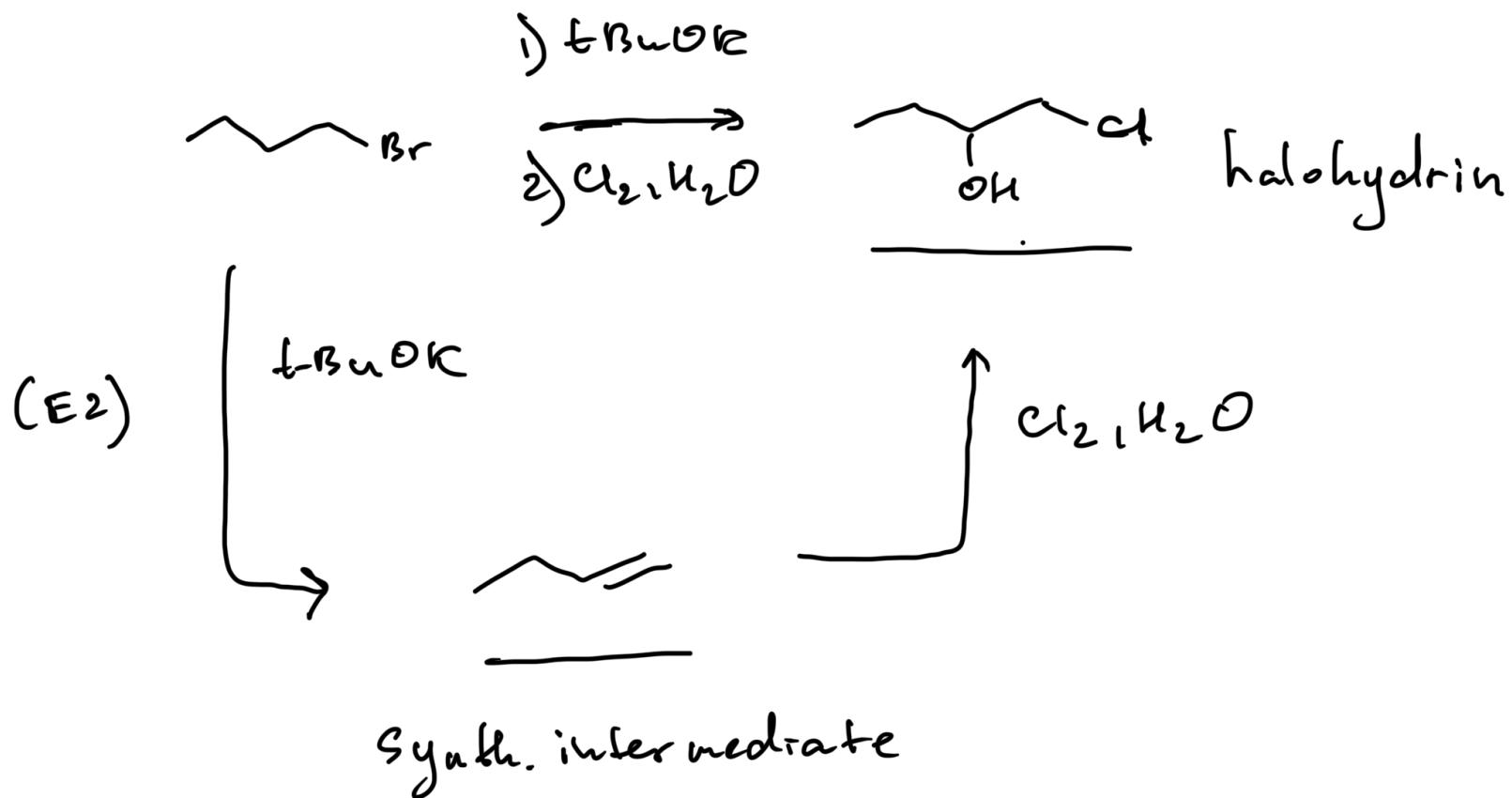
How to approach a synthesis problem that involves alkenes?



- identify synthetic intermediates
- work backwards: retrosynthetic analysis

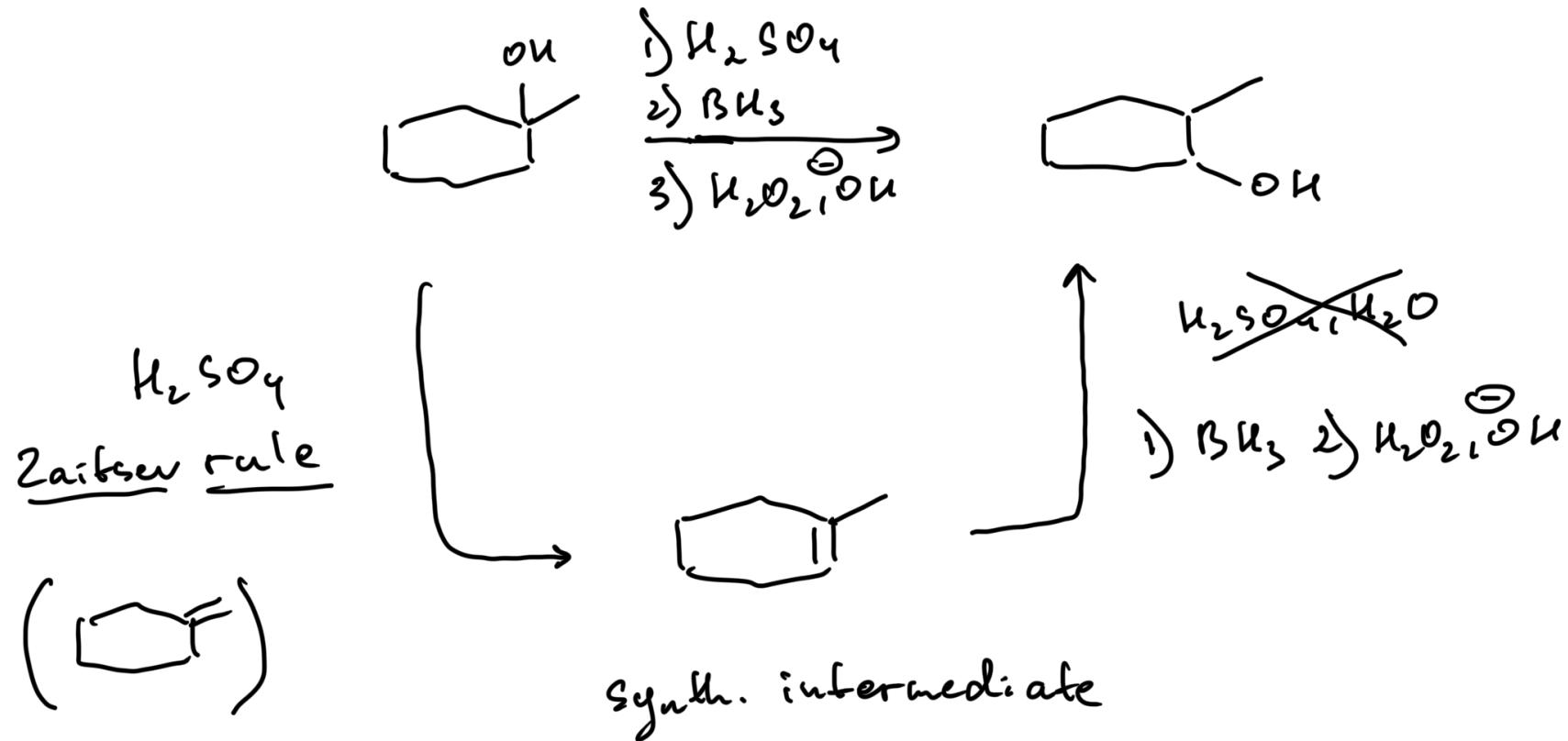
Alkenes in synthesis

Case studies



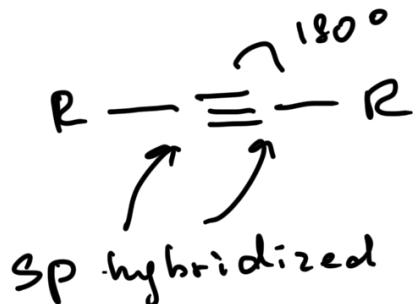
Alkenes in synthesis

Case studies

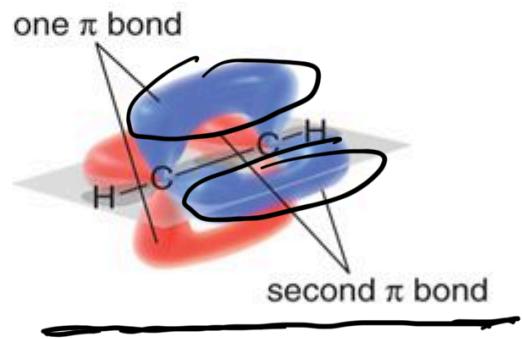


Alkynes

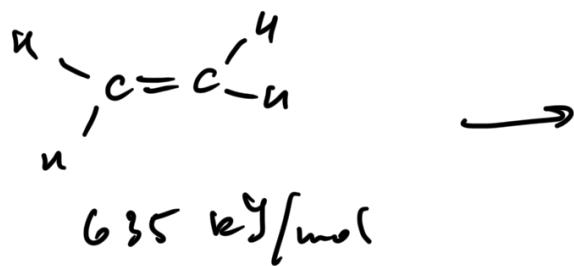
The carbon-carbon triple bond



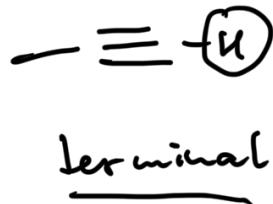
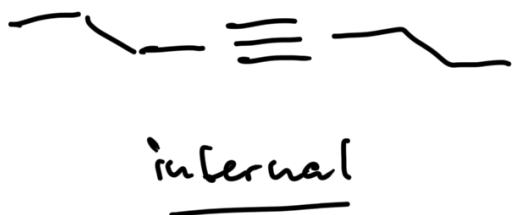
$2 \times \pi\text{-bonds}$
 $1 \times \sigma\text{-bonds}$



837 kJ/mol

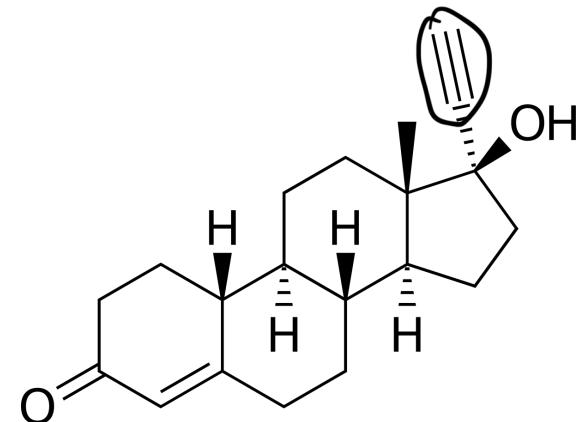


635 kJ/mol

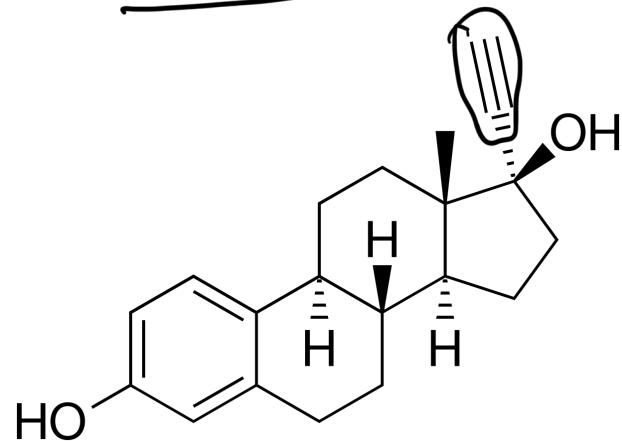


Alkynes

The welding torch and the pill



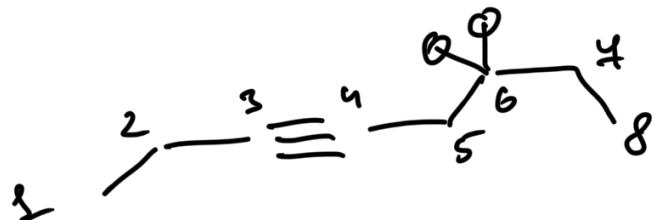
norethidrone



ethynodiol

Alkynes

Nomenclature

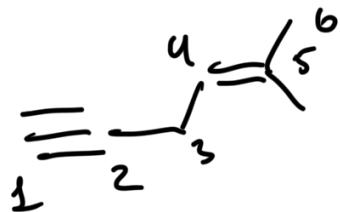


• octane

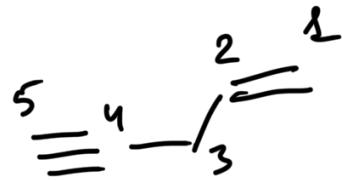
• oct-3-yne

6,6-dimethyl oct-3-yne

$\begin{array}{c} \text{---} \\ | \\ \text{---} \end{array}$ ethynyl group



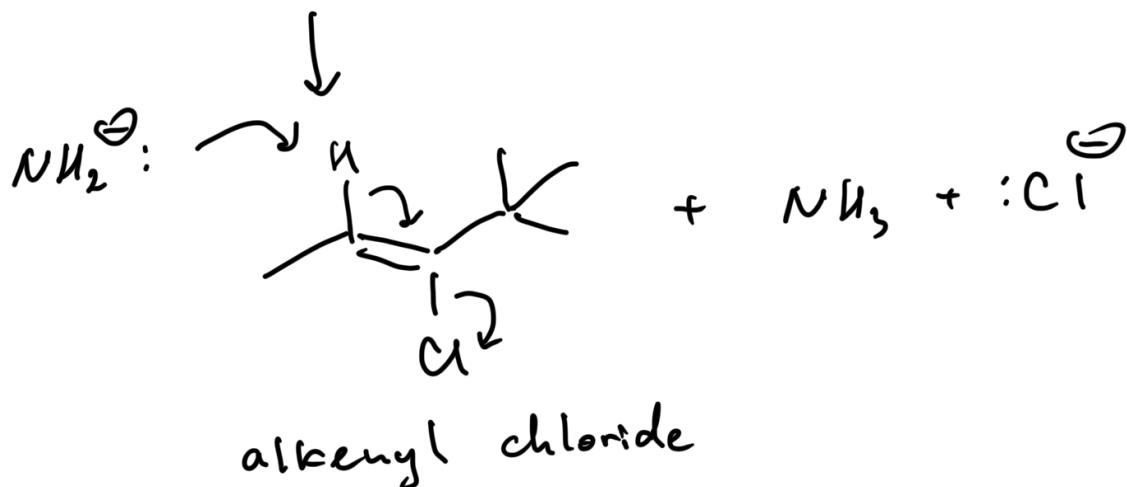
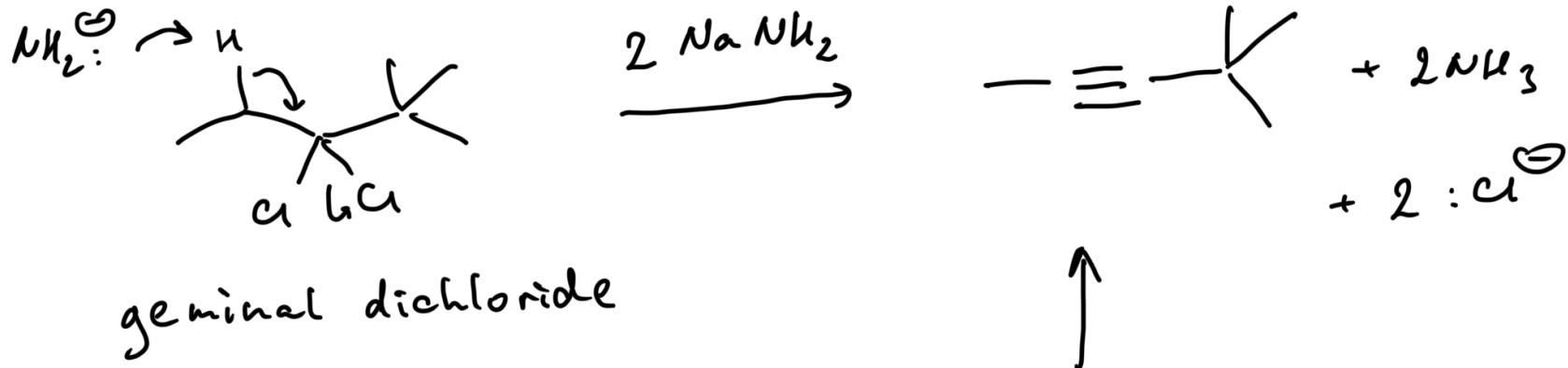
5-methyl hex-4-en-1-yne



pent-1-en-4-yne

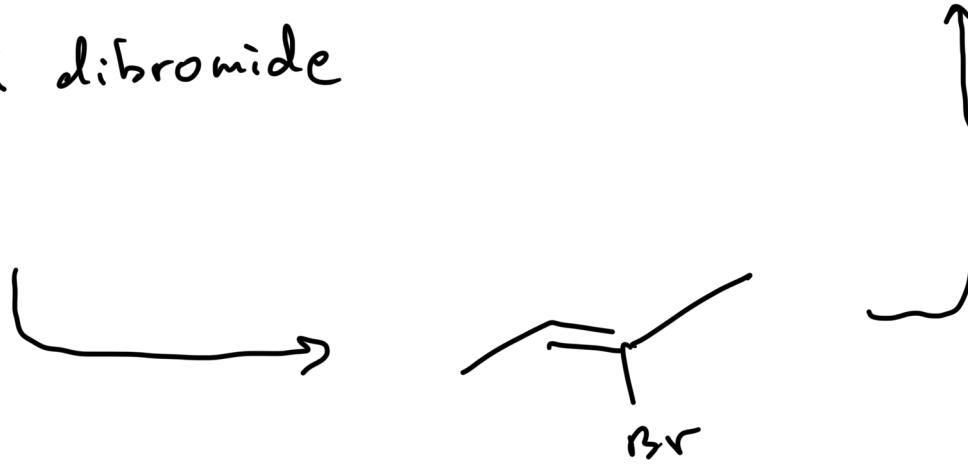
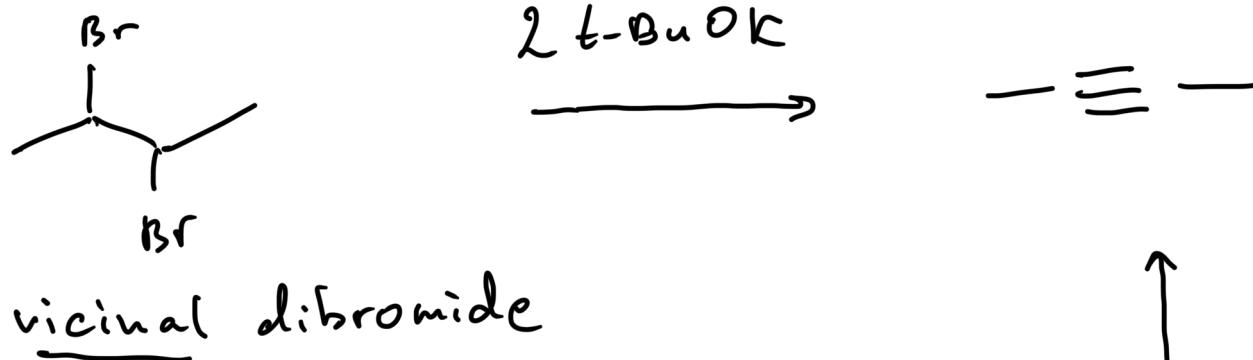
Alkynes: synthesis

Double elimination of dihalides



Alkynes: synthesis

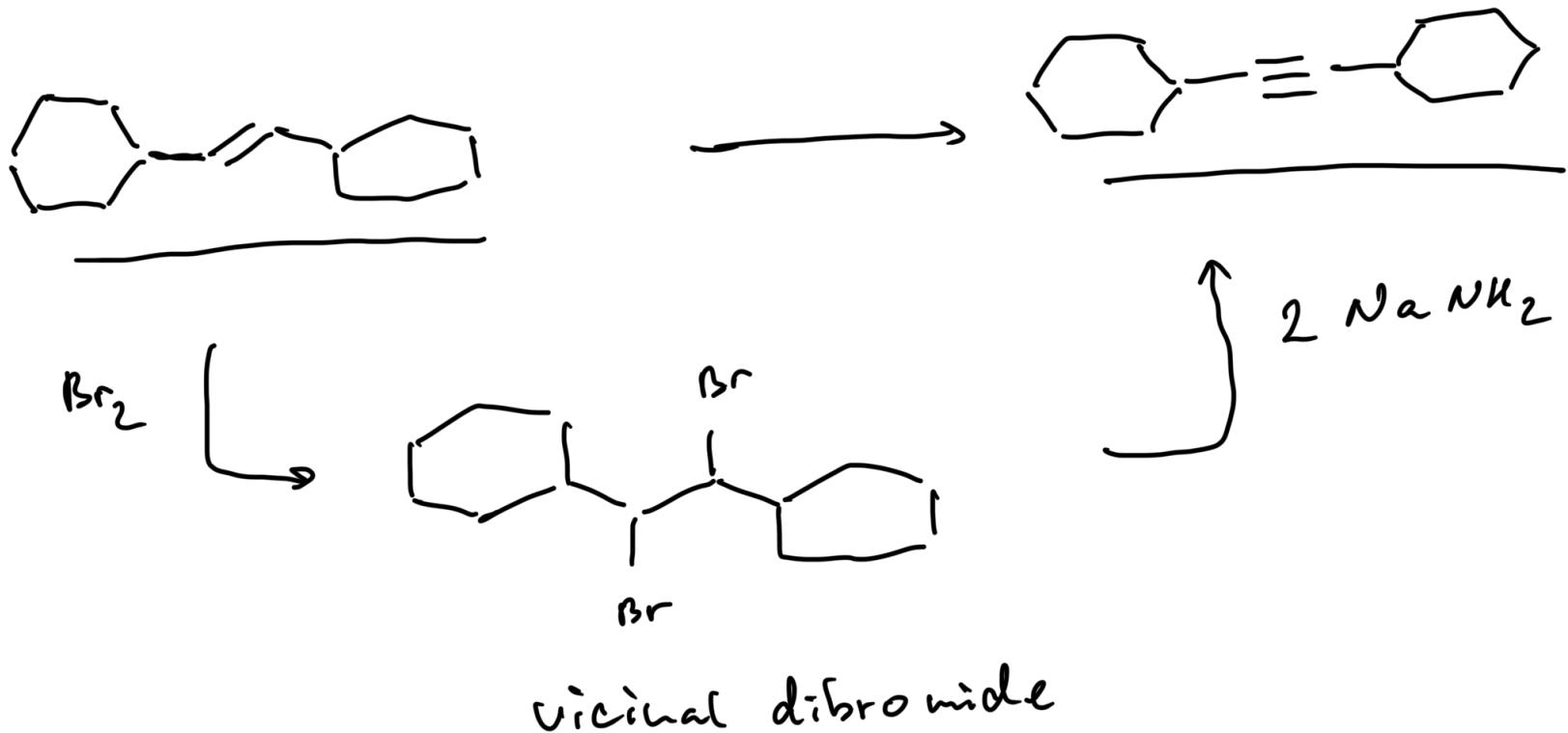
Double elimination of dihalides



alkynyl bromide

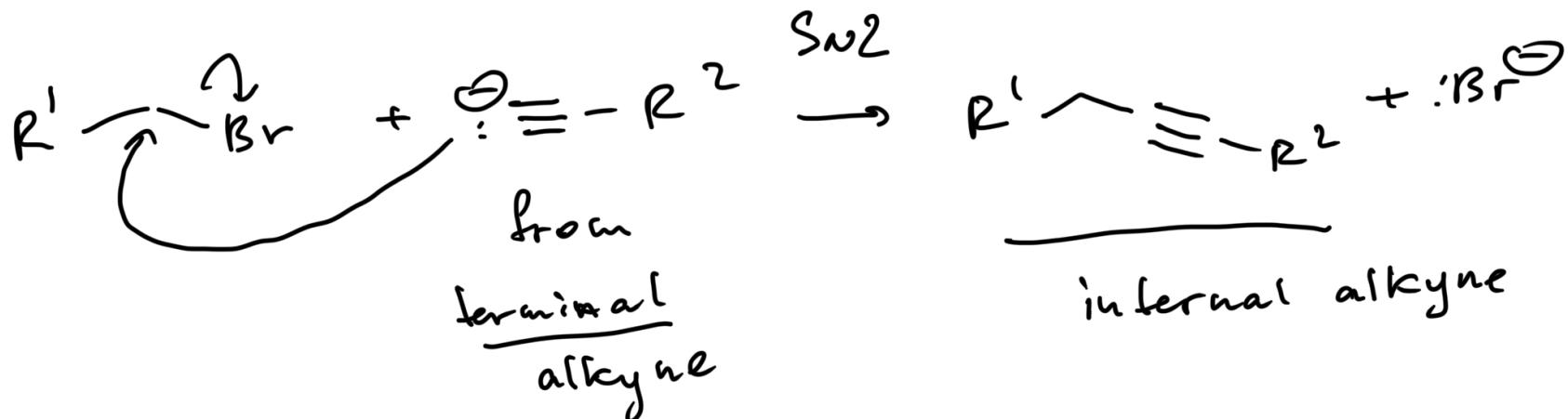
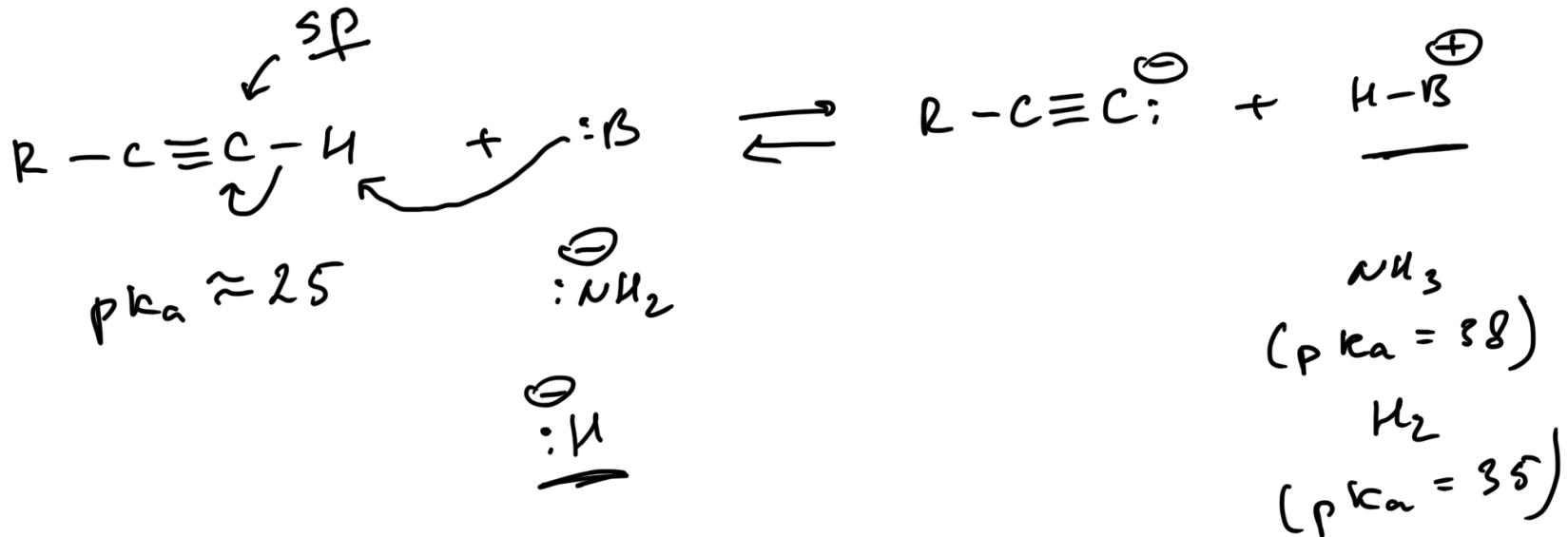
Alkynes: synthesis

Synthesis of alkynes from alkenes



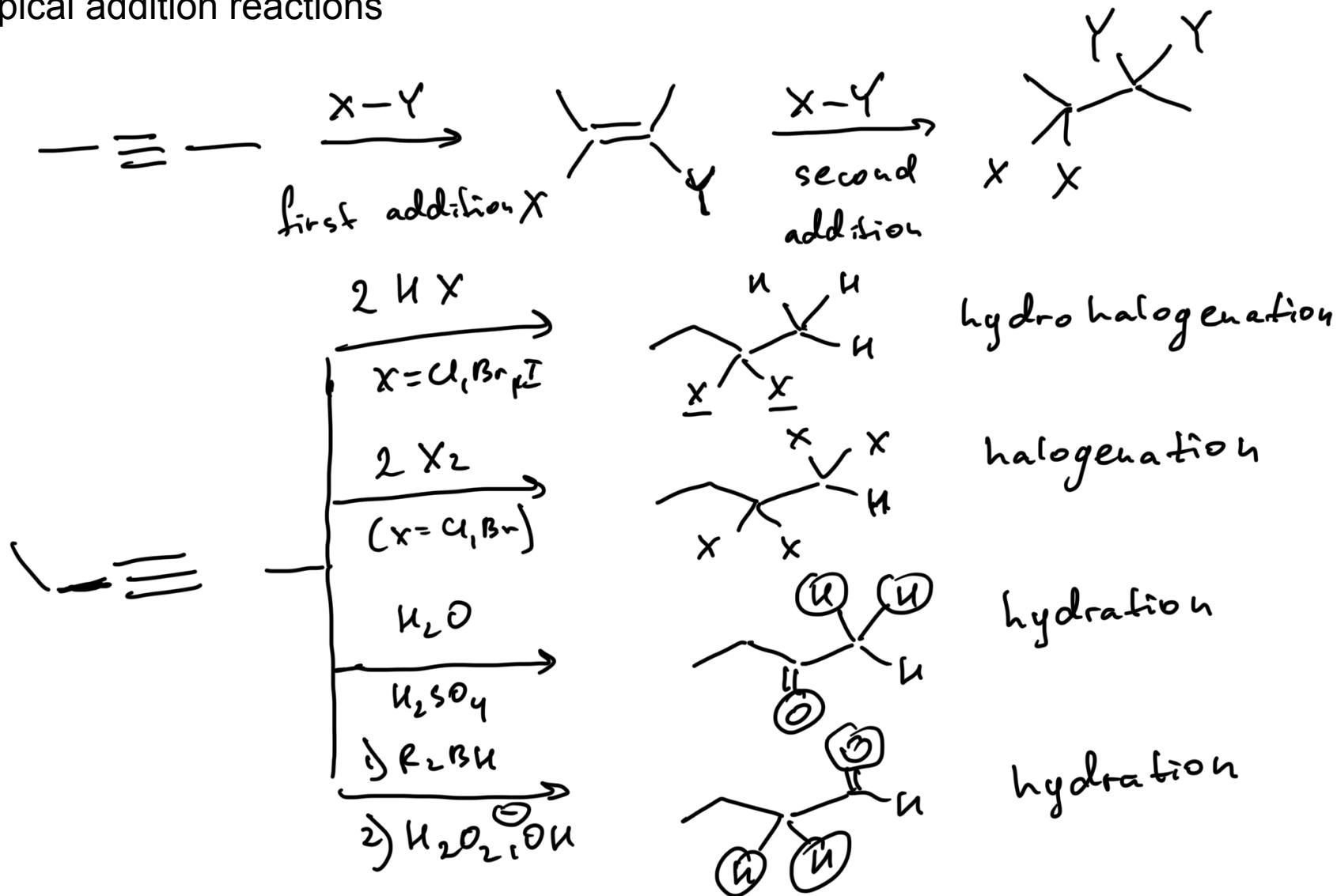
Reactions of alkynes: deprotonation

Acidity of terminal alkynes. Reactions of acetylide anions with electrophiles



Reactions of alkynes: addition

Typical addition reactions



Reactions of alkynes: hydrohalogenation

General considerations. Regioselectivity

Reactions of alkynes: hydrohalogenation

Resonance stabilization of carbocations

Reactions of alkynes: addition of halogens

General considerations.

Reactions of alkynes: addition of halogens

Mechanism and stereoselectivity

Reactions of alkynes: hydration

General considerations

Reactions of alkynes: hydration

Mechanism

Reactions of alkynes: hydration

Enols and tautomerization