

Alkyny



Alkyny - klasifikace



ethyn
(acetylen)

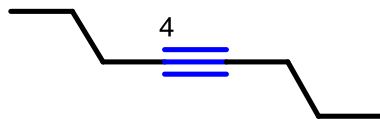


terminální alkyn

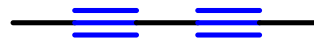


interní alkyn

Alkyny – názvosloví (přípona **-yn**)

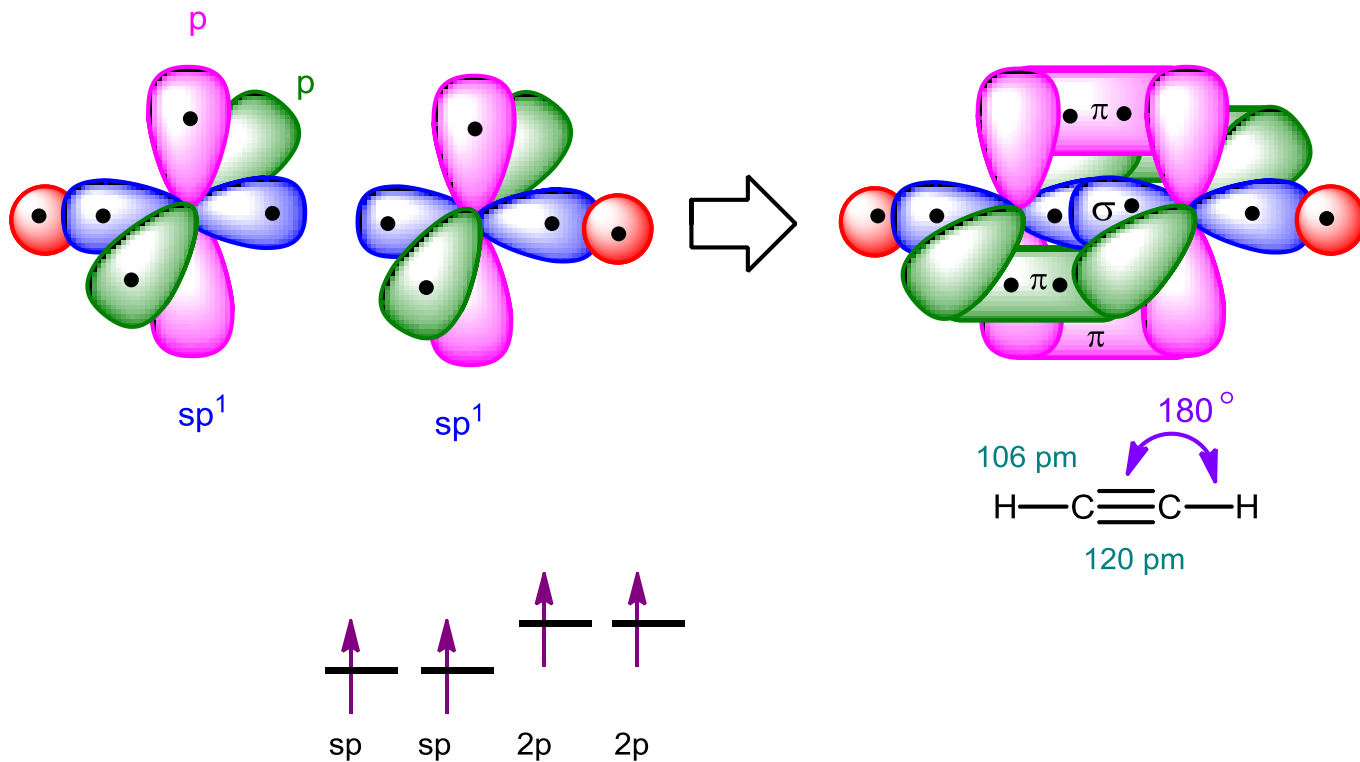


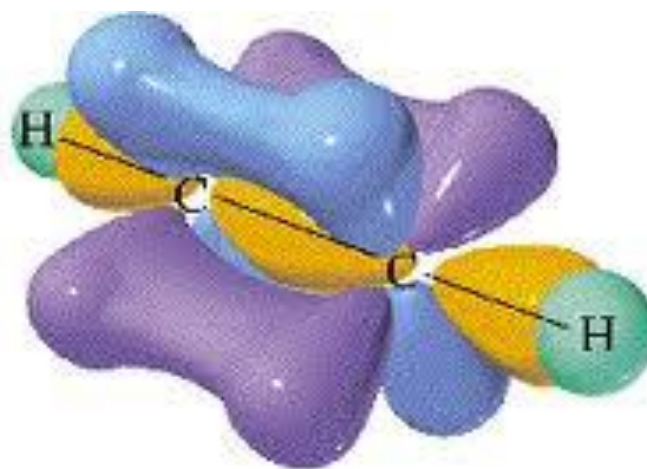
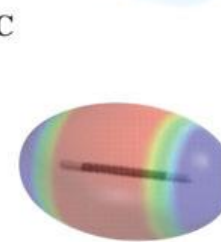
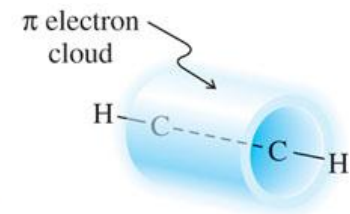
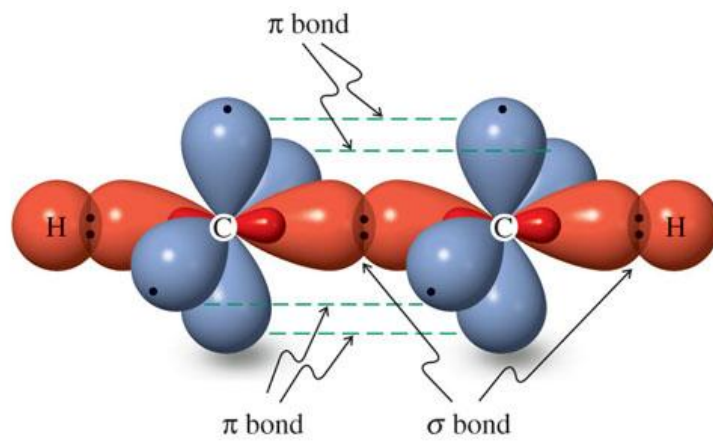
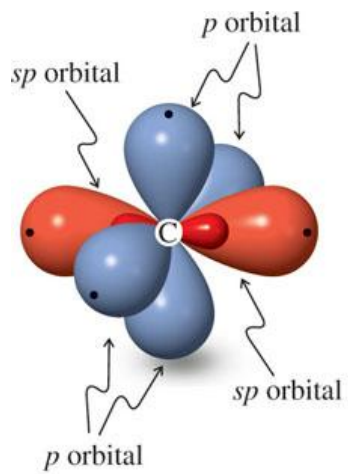
okt-4-yn

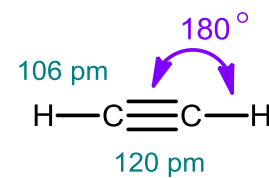
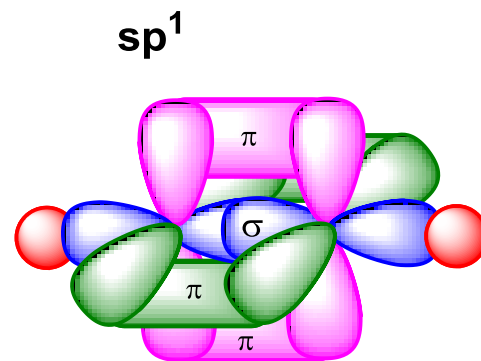
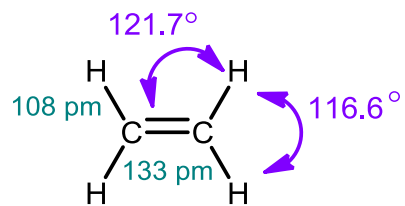
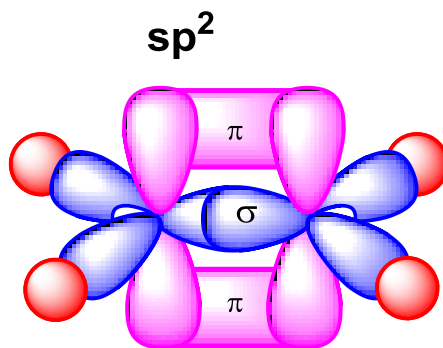
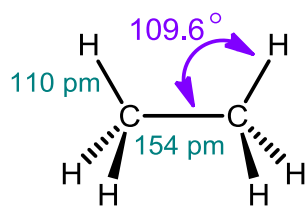
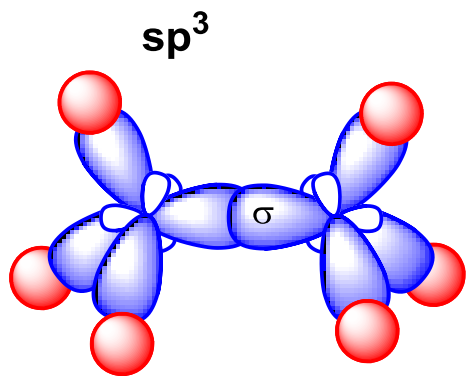


hexa-2,4-diyne

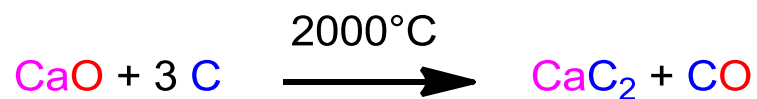
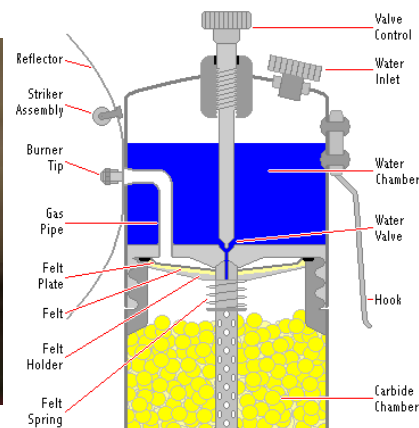
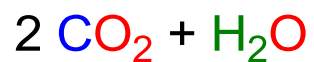
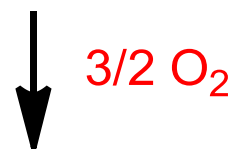
Molekulové orbitály – trojná vazba $C\equiv C$, molekula ethynu



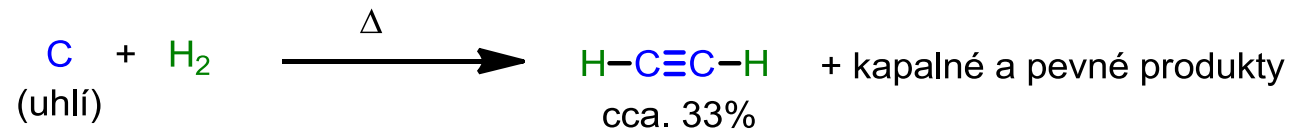




Karbid vápenatý – karbidová lampa

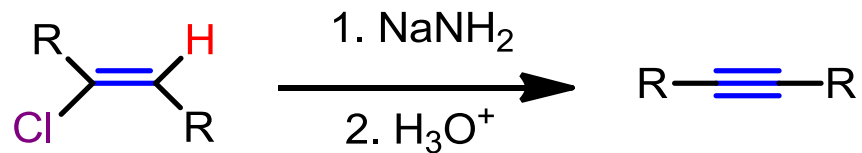
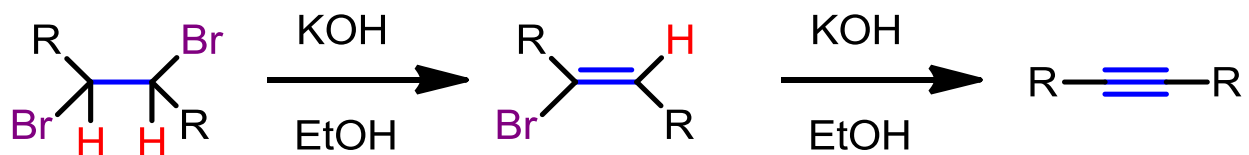


Průmyslová výroba acetylenu



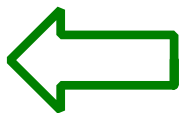
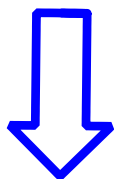
Příprava alkynů - eliminace

Eliminace halogenovodíků - silnou bází



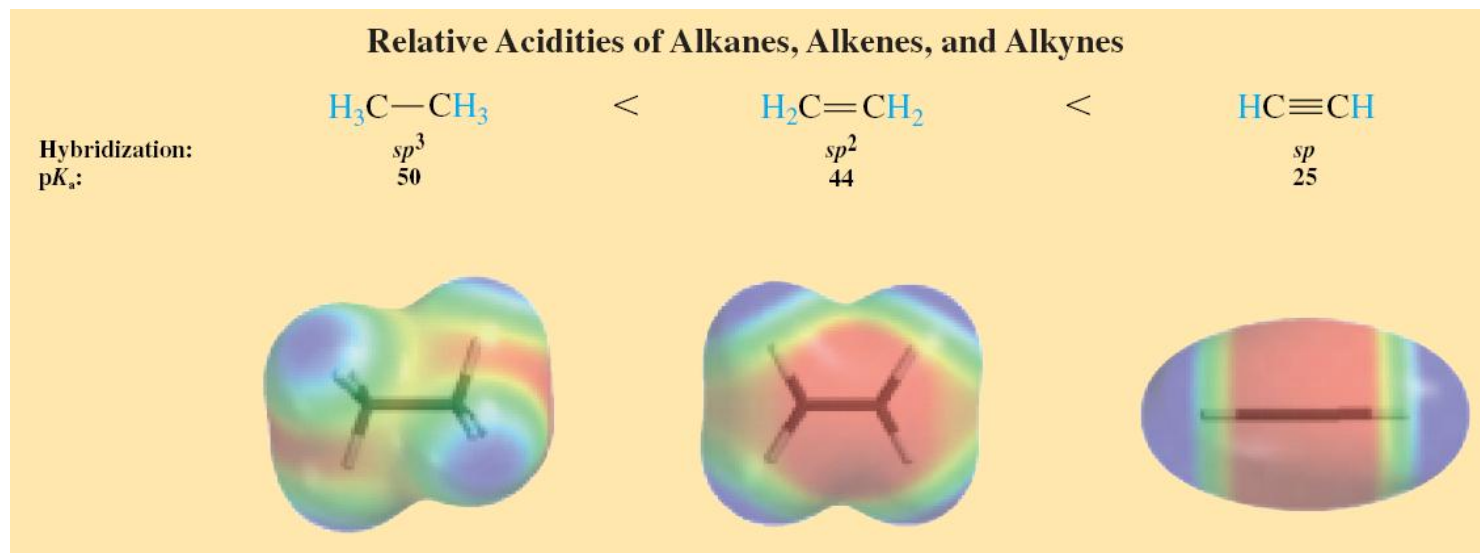
Reaktivita alkynů

Reakce trojné vazby
(adice)



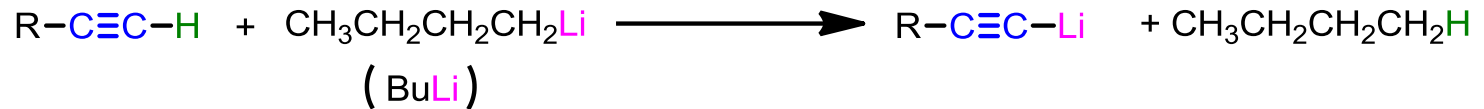
Reakce koncové C-H
(deprotonace....)

Acidita terminálních alkynů

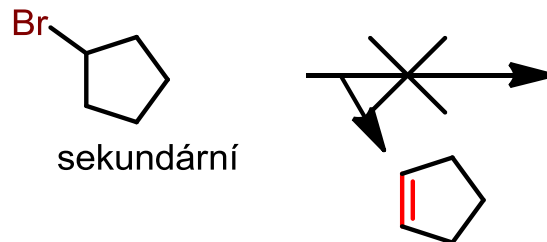
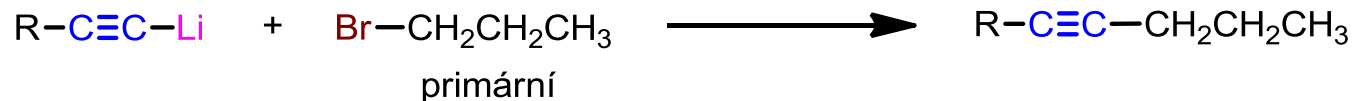


Deprotonace terminálních alkyň a následné reakce

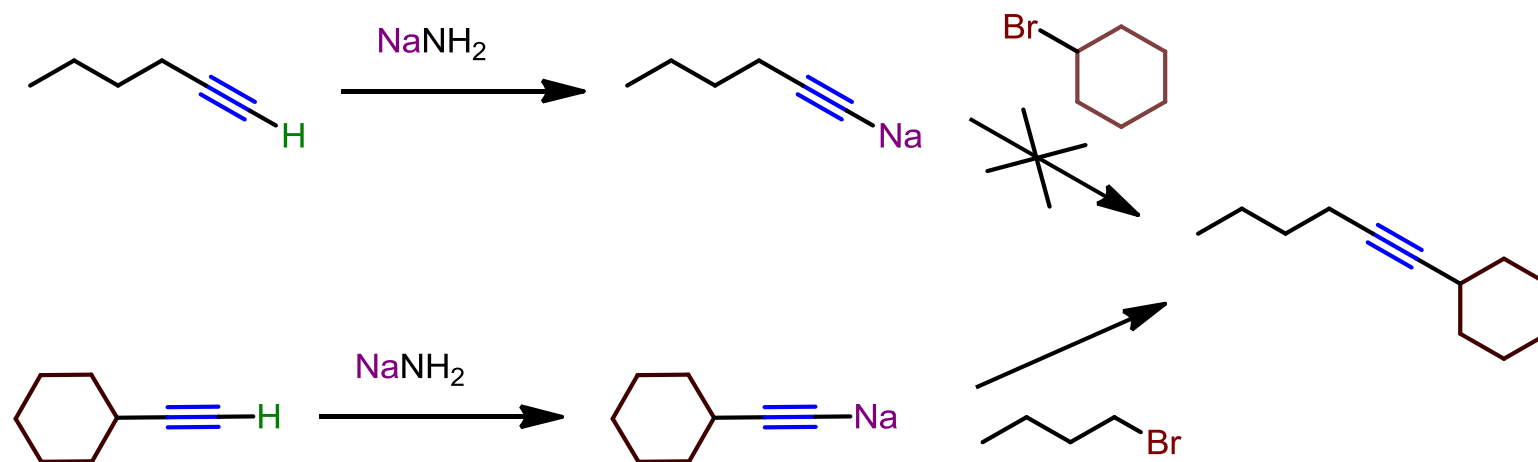
Reakce se silnými bázemi - deprotonace



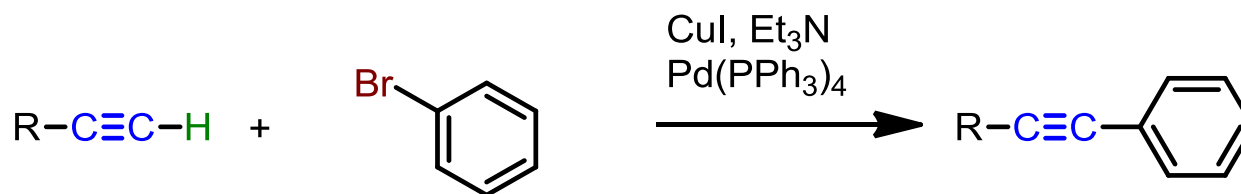
Deprotonace + alkylace



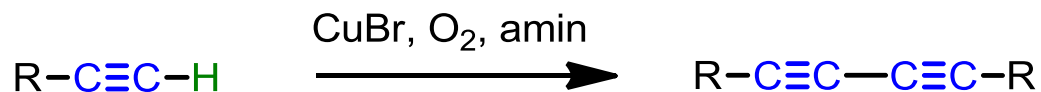
Deprotonace + alkylace - organická syntéza



Sonogashirova reakce – příprava aryl-alkynů

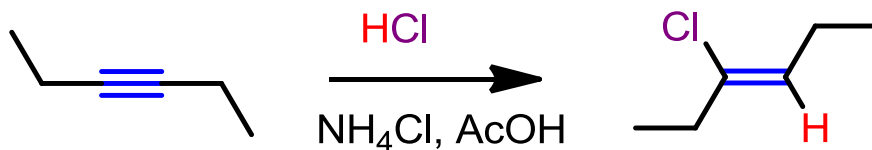
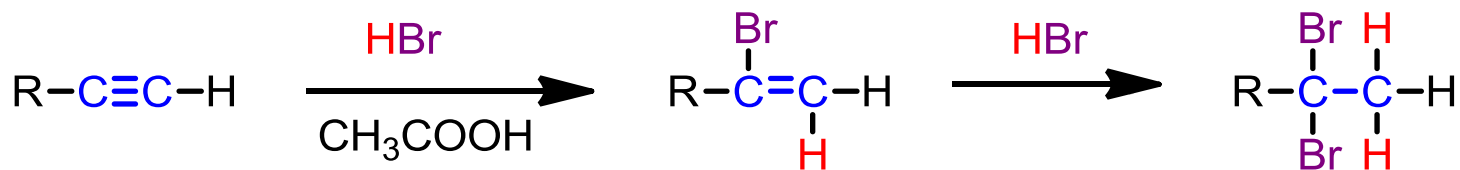


Glaserův coupling – příprava diacetylenů



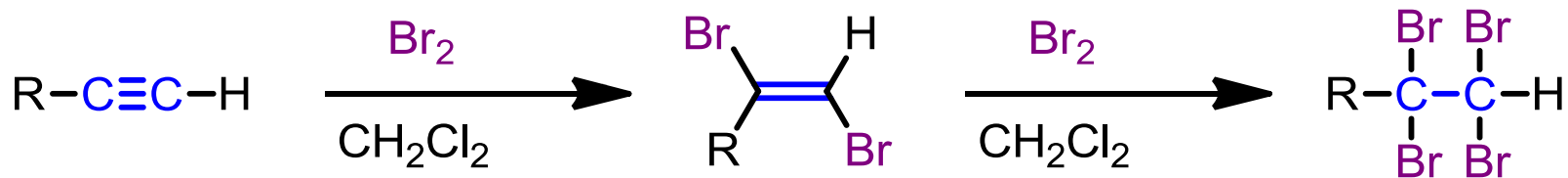
Adice na alkeny

Adice halogenvodíků

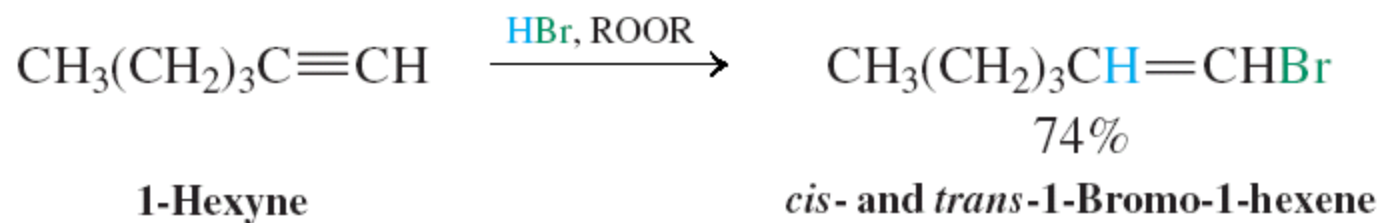


adice HX probíhají obvykle jako *anti*-adice

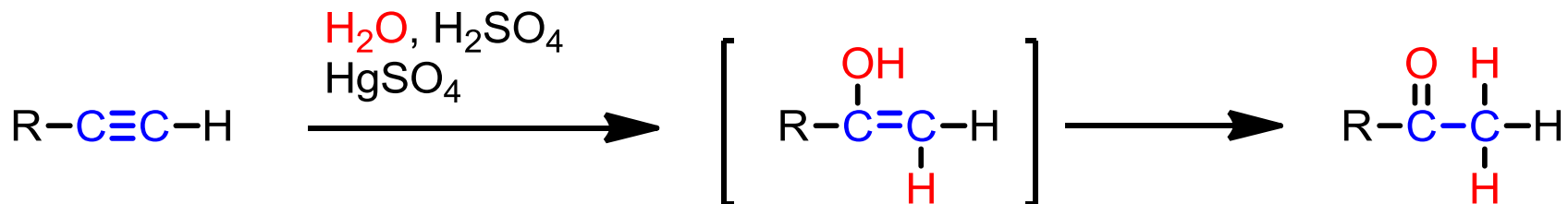
Adice halogenů



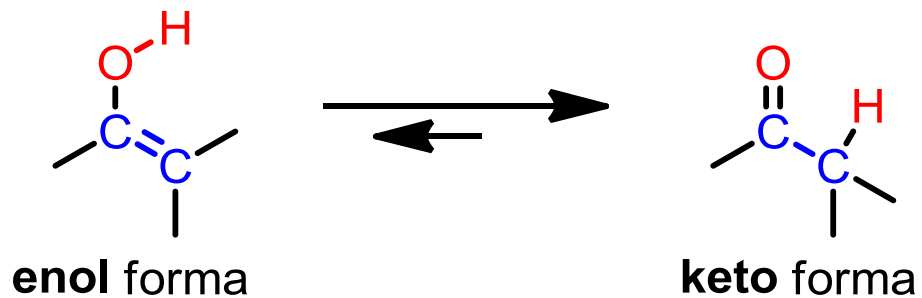
Radikálová adice HBr na alkyny – neprobíhá podle Markovnikova pravidla



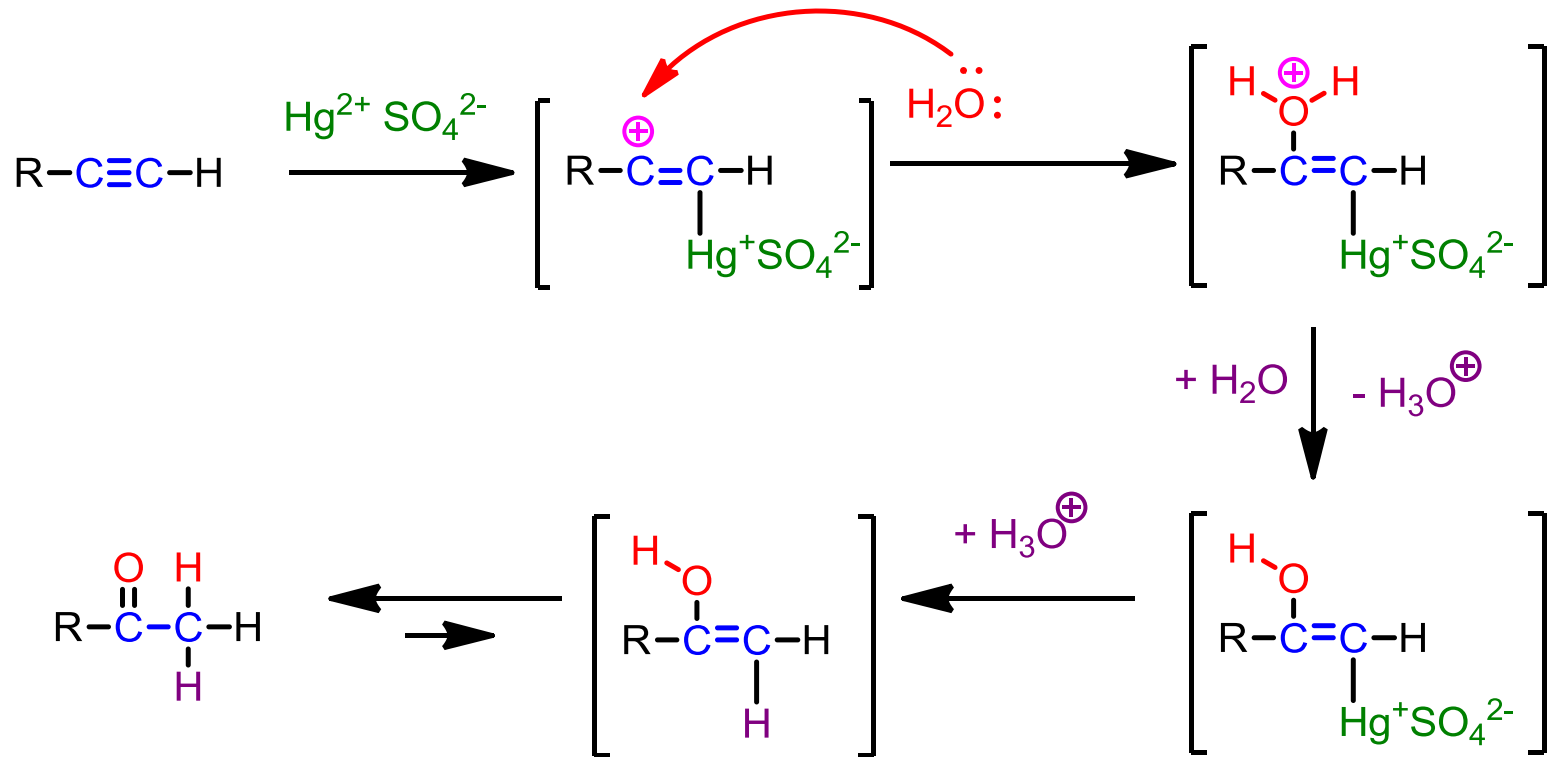
Hydratace alkynů katalyzovaná Hg^{2+}



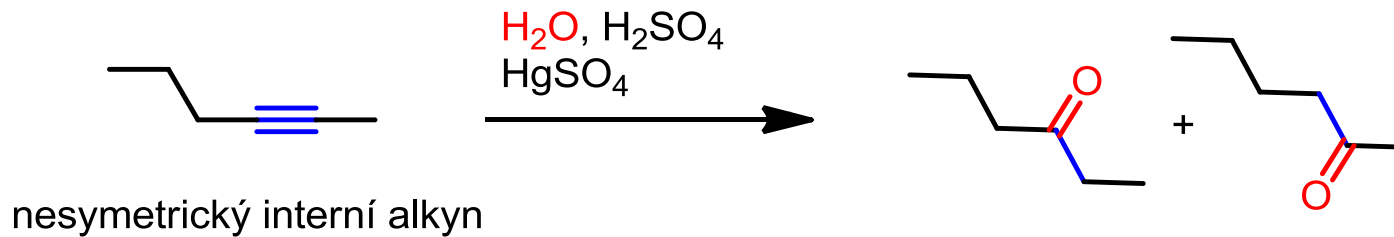
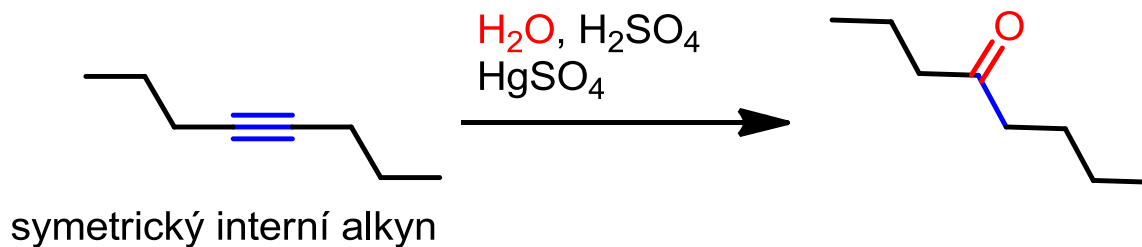
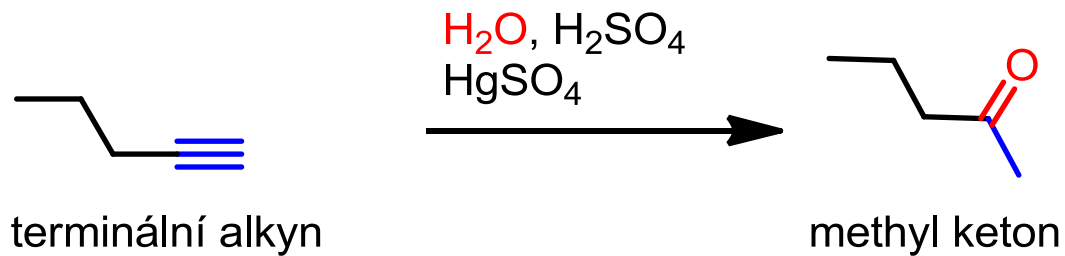
Keto-enol tautomerie



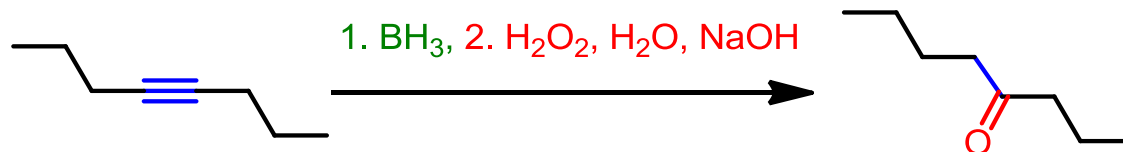
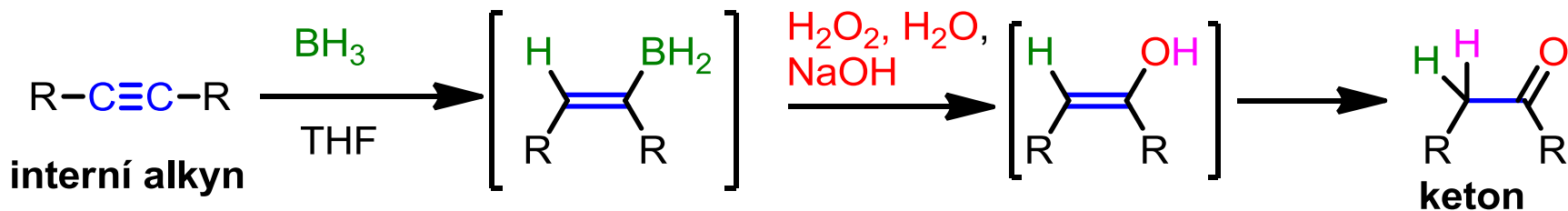
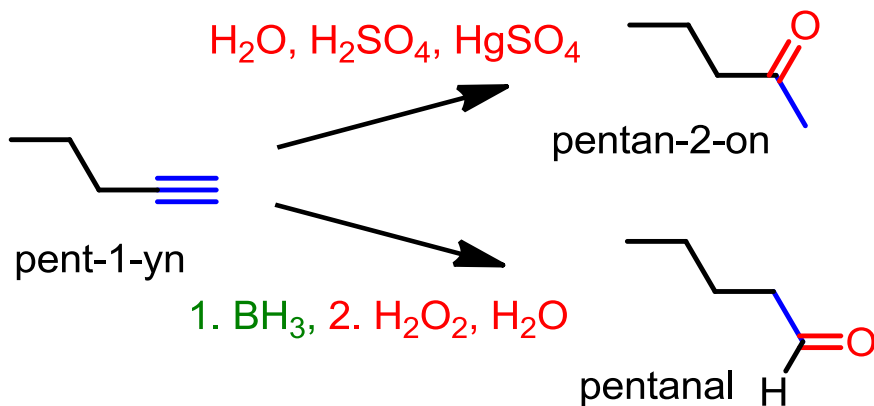
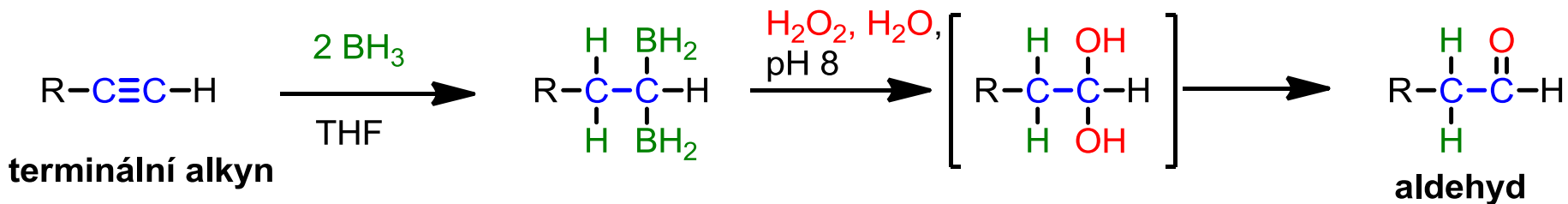
Mechanismus hydratace alkynů



Syntetické využití hydratace alkynů

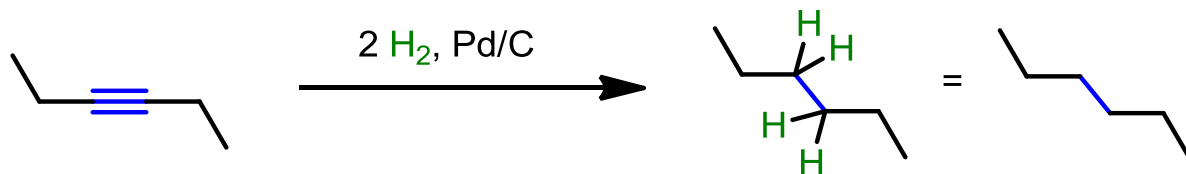


Hydroborace alkynů následovaná oxidací

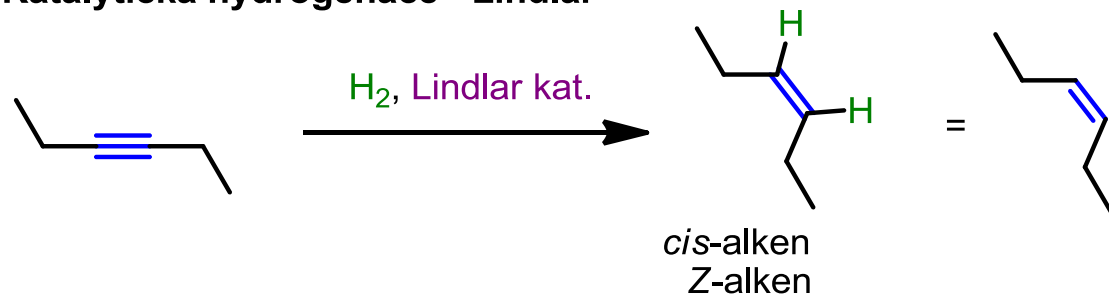


Redukce alkynů

Katalytická hydrogenace

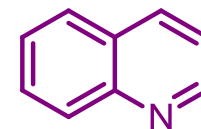


Katalytická hydrogenace - Lindlar

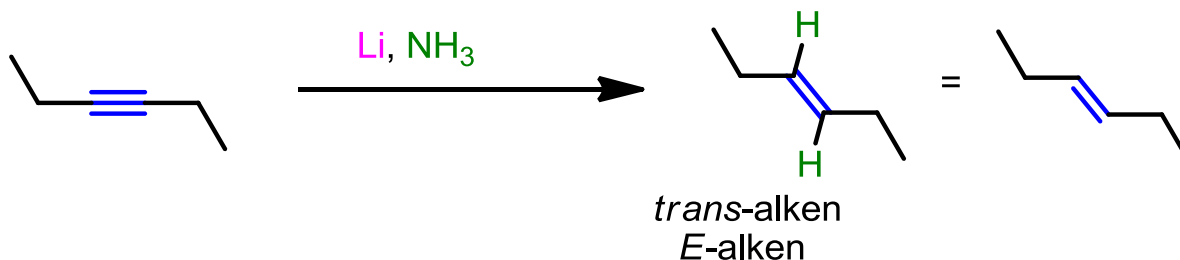


Lindlarův katalyzátor

5% Pd/CaCO₃, Pb(OAc)₄, chinolin

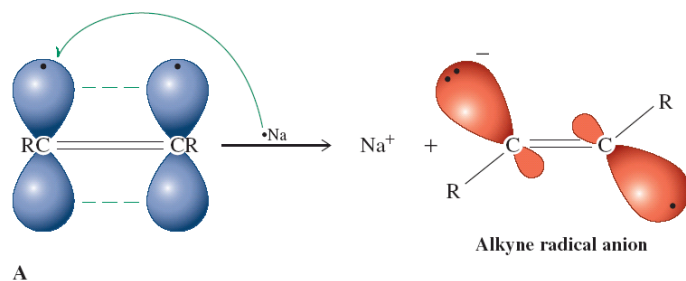


Redukce alkalickým kovem v kapalném amoniaku (Birchova redukce)

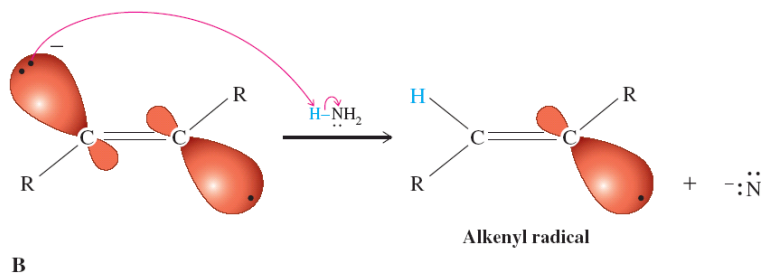


Mechanism of the Reduction of Alkynes by Sodium in Liquid Ammonia:

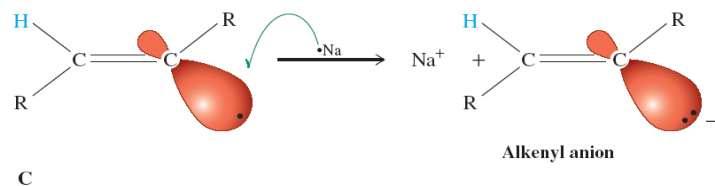
STEP 1. One-electron transfer



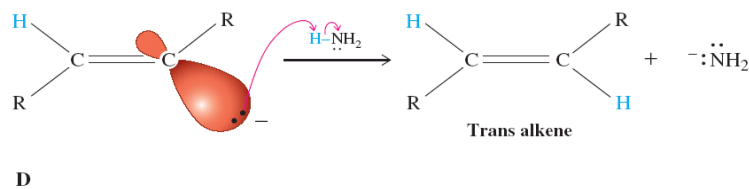
STEP 2. First protonation



STEP 3. Second one-electron transfer



STEP 4. Second protonation



Druhý transfer elektronu je rychlejší než cis/trans izomerizace alkenylového radikálu.

Finální alken je stabilní vůči redukci.

Oxidativní štěpění alkynů

