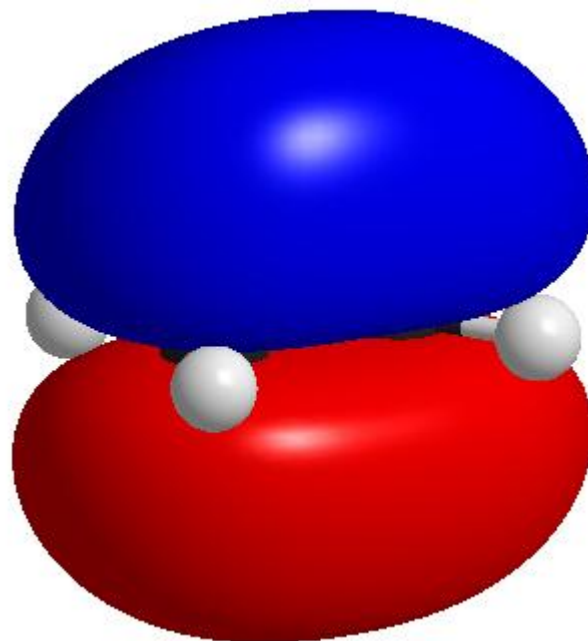
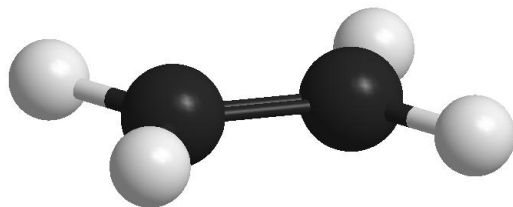
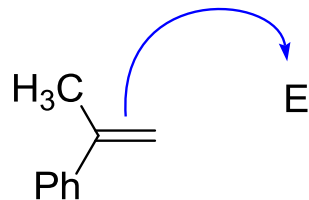


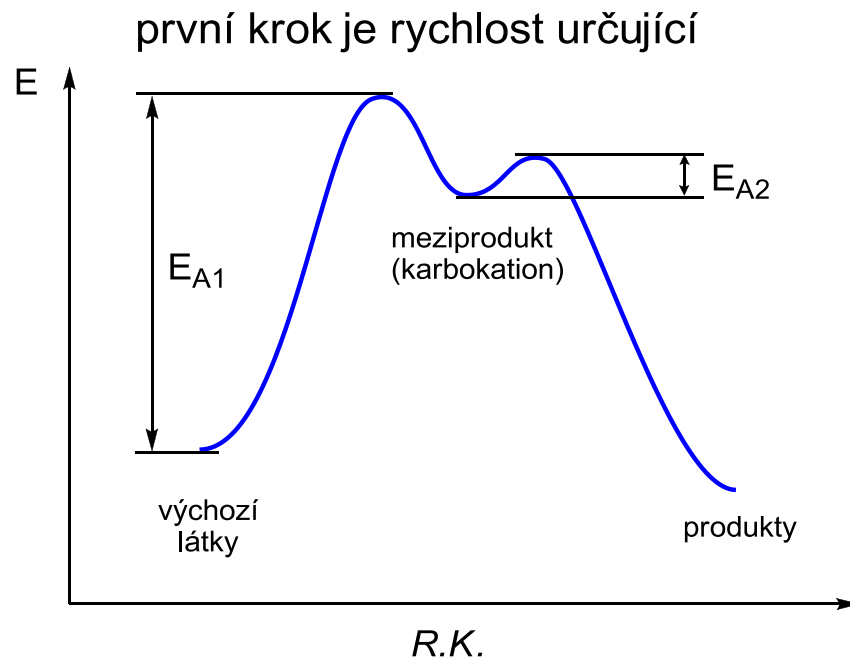
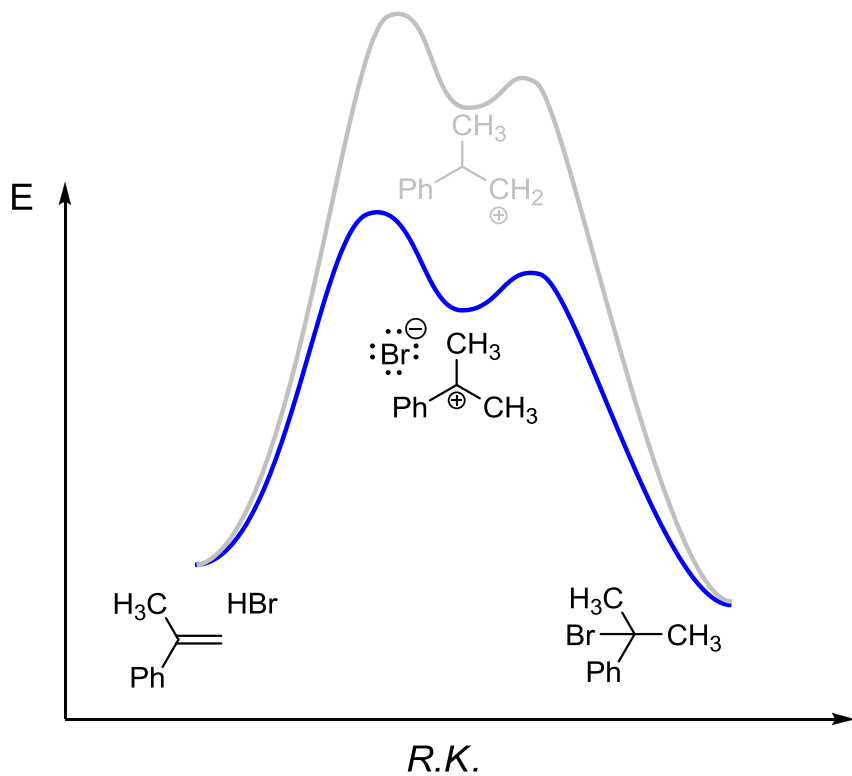
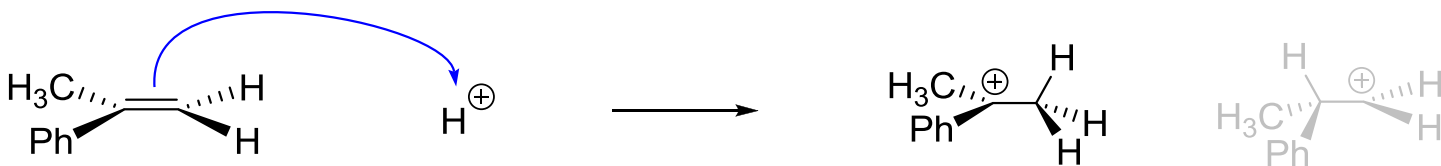
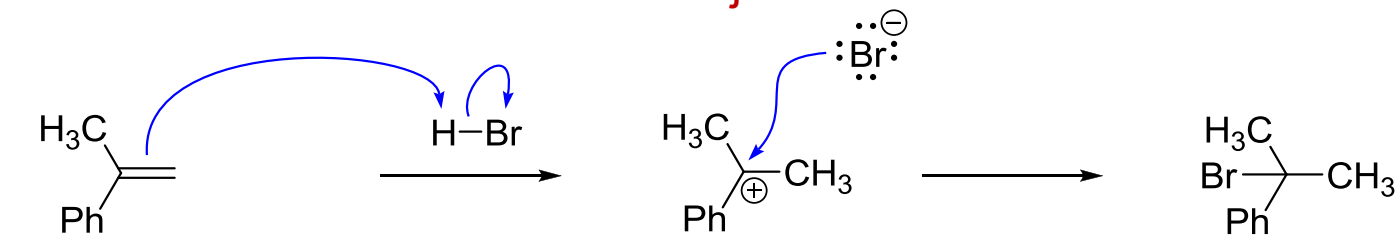
## Elektrofilní adice na dvojnou vazbu

(izolovaná) dvojná vazba je nukleofil a reaguje s elektrofilými...

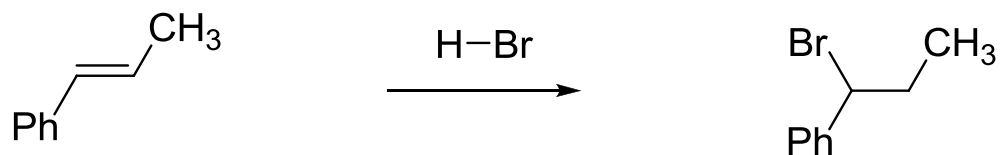
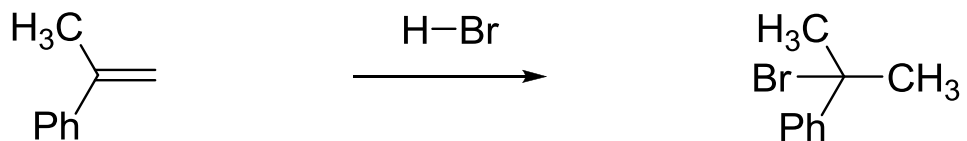
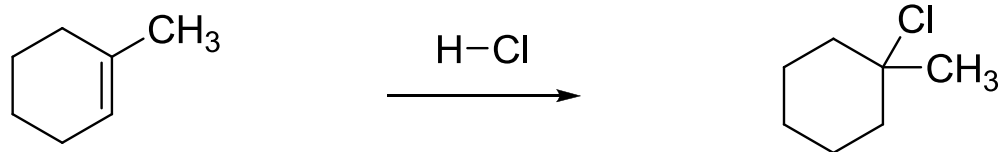


HOMO

# Elektrofilní adice na dvojnou vazbu: adice H-X

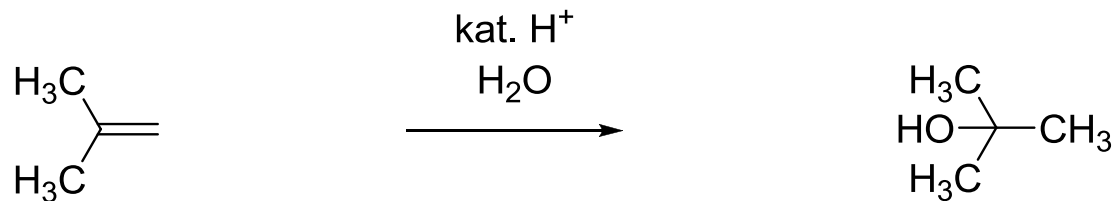
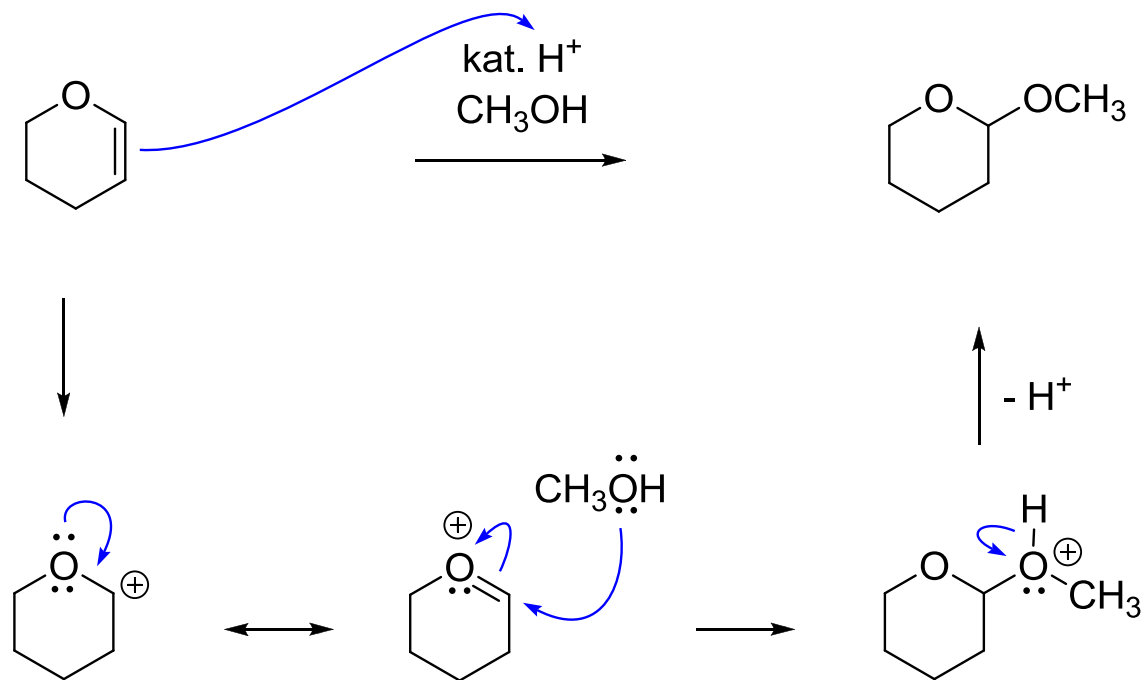


## Elektrofilní adice na dvojnou vazbu: **adice H-X**



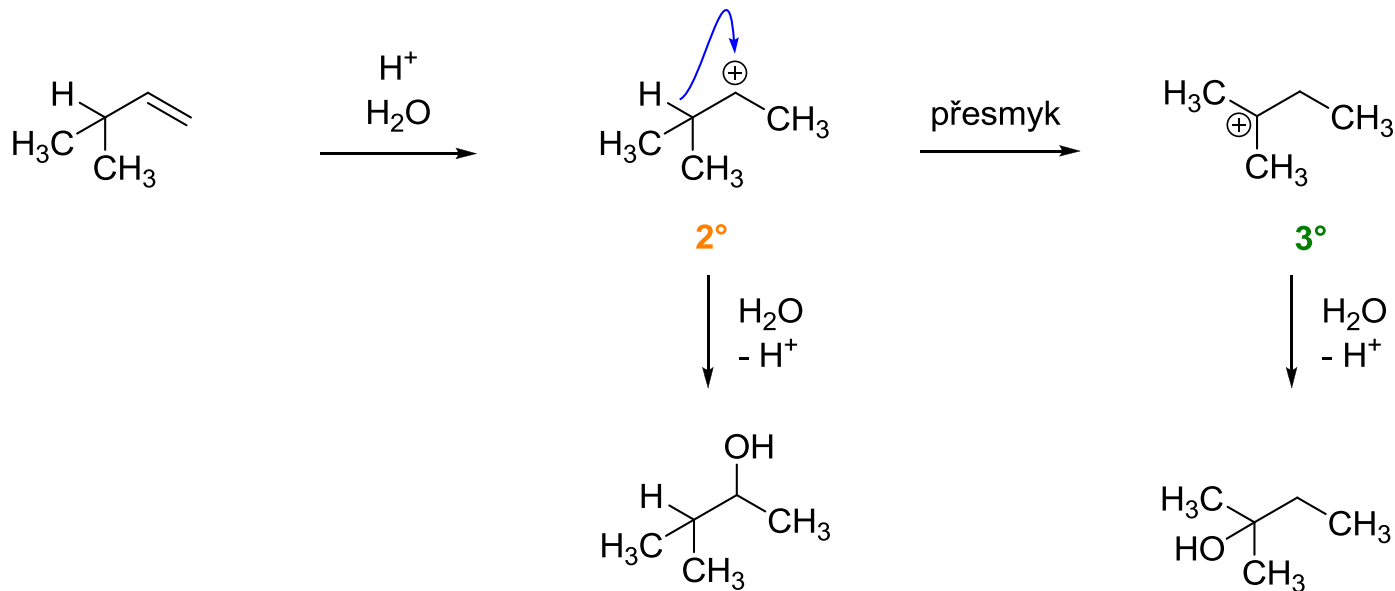
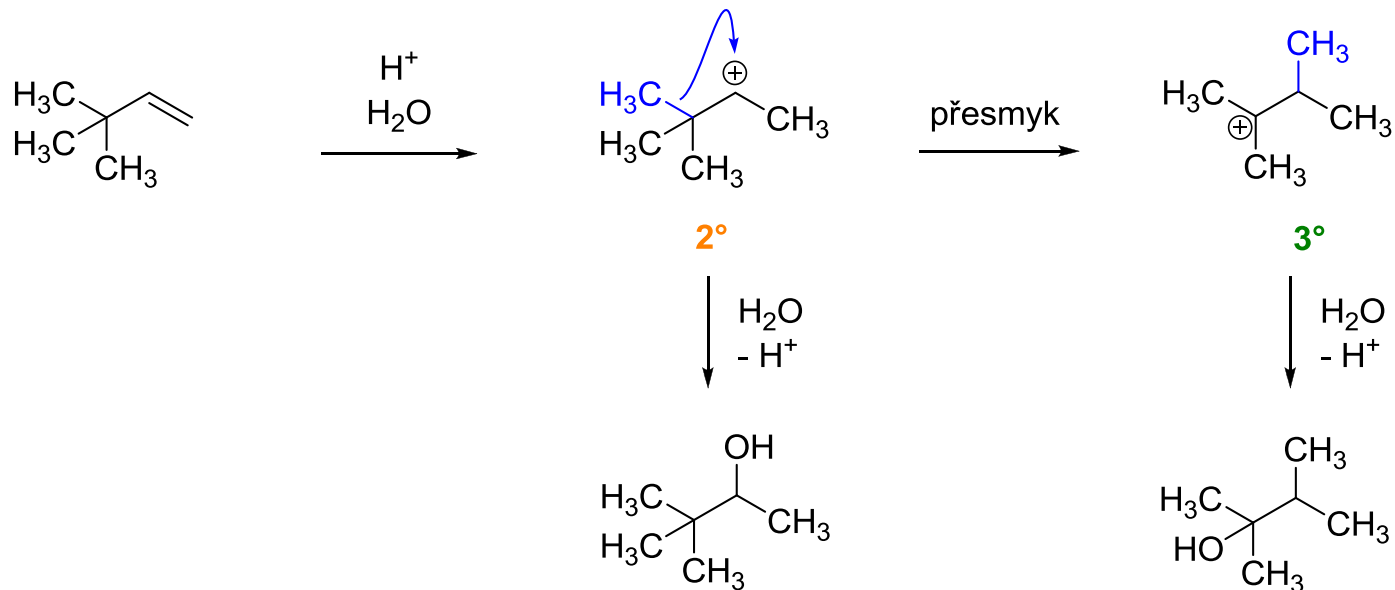
adice H-X není stereospecifická: jak H<sup>+</sup>, tak i X<sup>-</sup> může přistupovat shora i zdola

# Elektrofilní adice na dvojnou vazbu: adice ROH/H<sup>+</sup>, H<sub>2</sub>O/H<sup>+</sup>

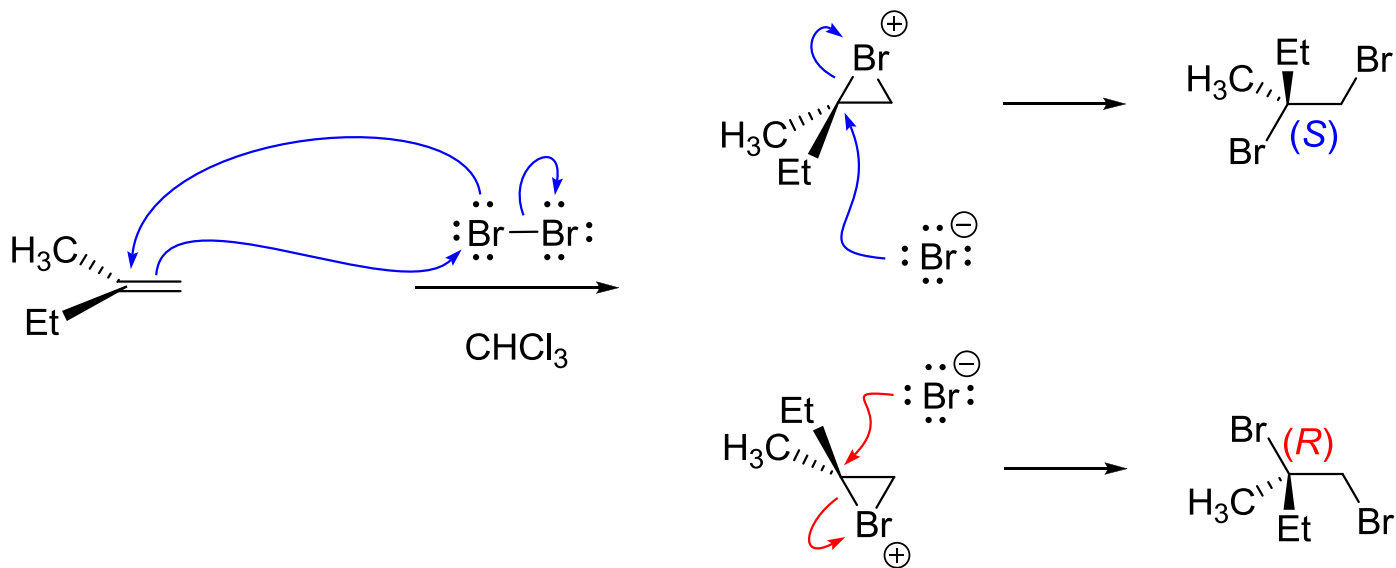




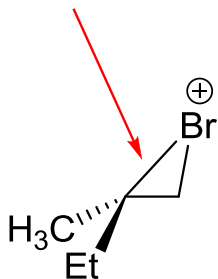
## Přesmyk karbokationtů



# Elektrofilní adice na dvojnou vazbu: adice $\text{Br}_2$ v nenukleofilním rozpouštědle

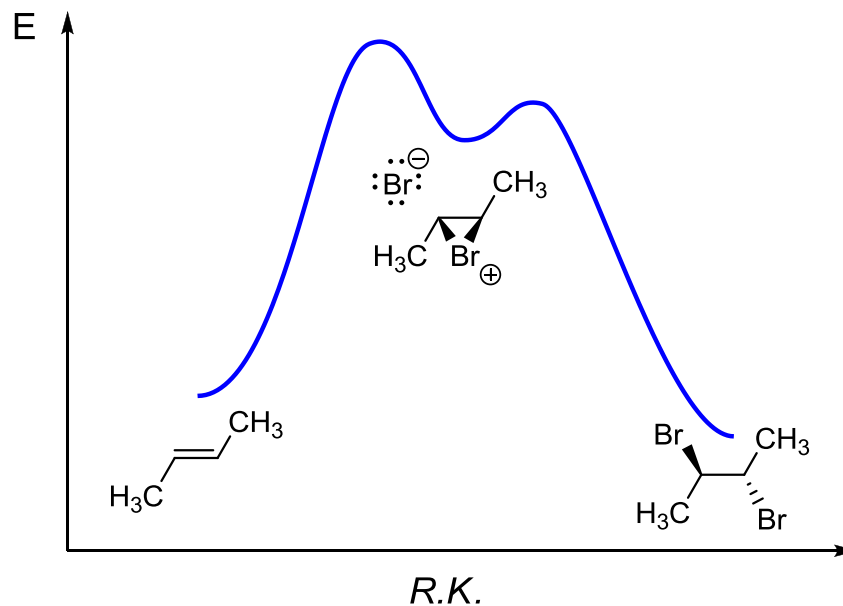
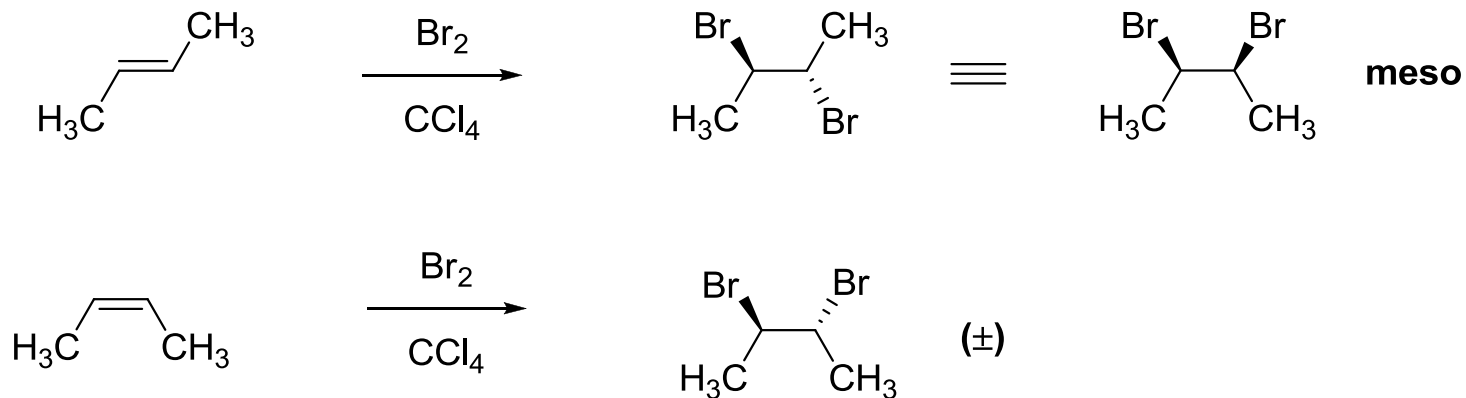


delší a slabší vazba v  
tříčlenném bromoniovém meziprojektu

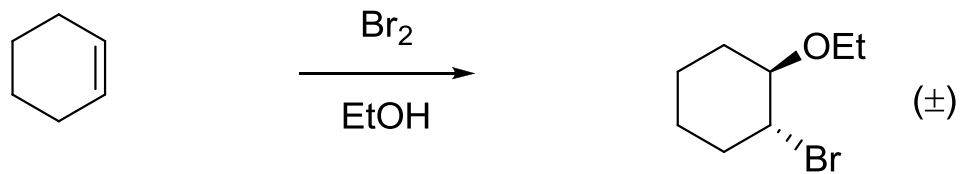
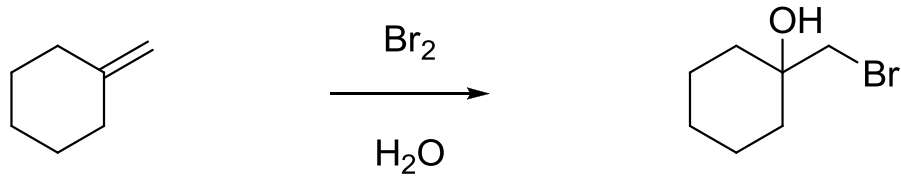
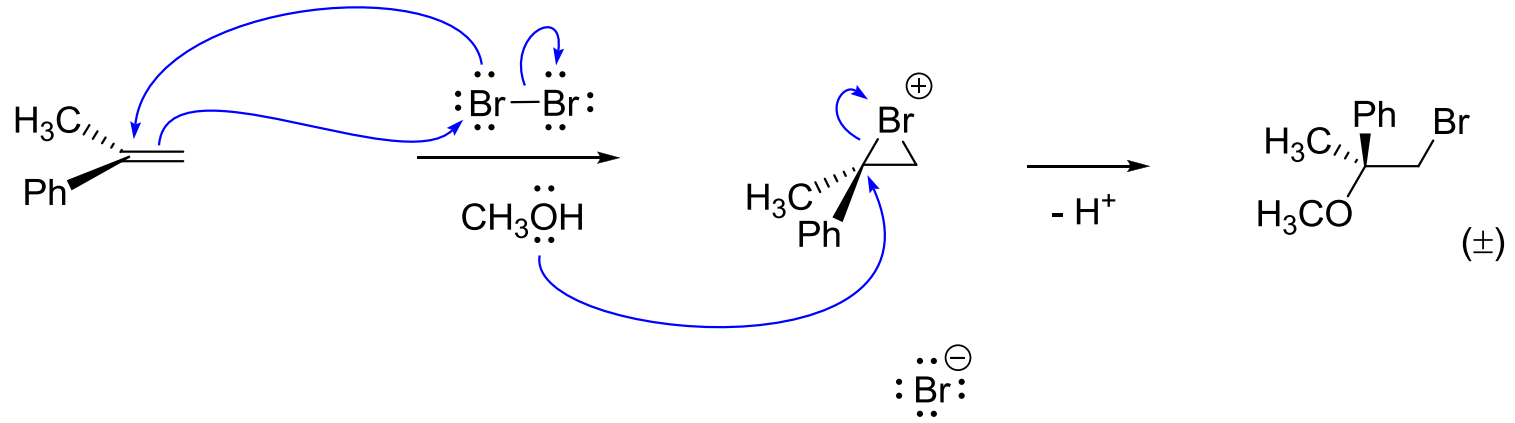


- atak shora a zdola ( $\rightarrow$  racemát)
- vznik bromoniového (tříčlenného) meziprojektu
- nevzniká karbokation ( $\rightarrow$  nedochází k přesmyku)
- nukleofil atakuje více substituovanou stranu
- stereospecifická reakce: atak z opačné strany

# Elektrofilní adice na dvojnou vazbu: adice $\text{Br}_2$ v nenukleofilním rozpouštědle

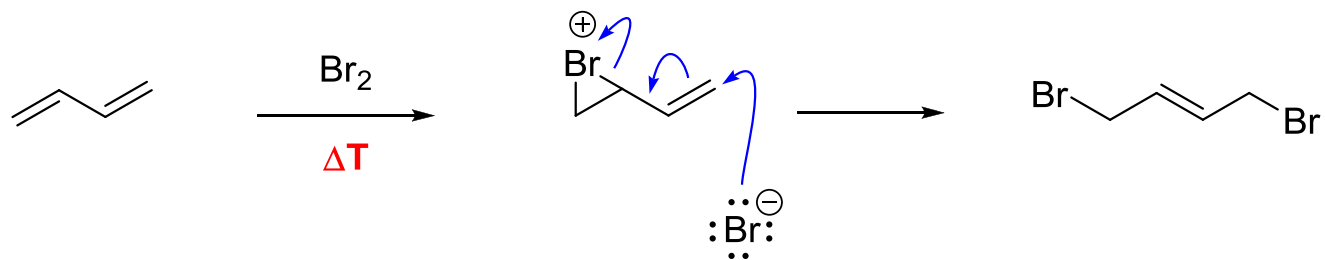
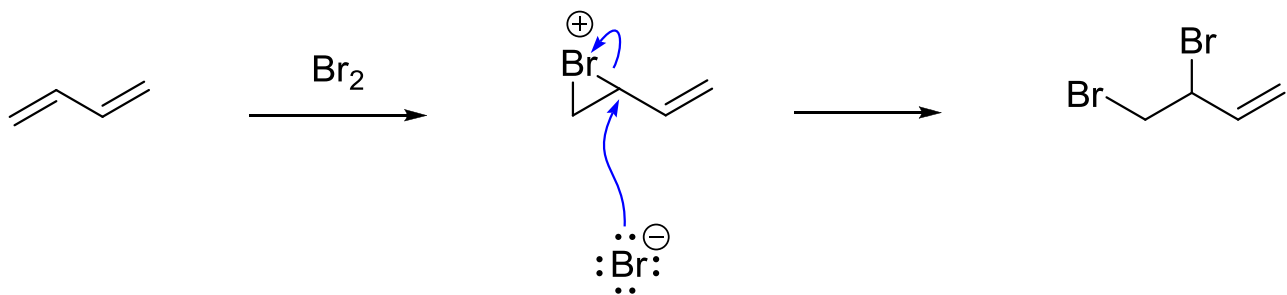


# Elektrofilní adice na dvojnou vazbu: adice $\text{Br}_2$ v nukleofilním rozpouštědle

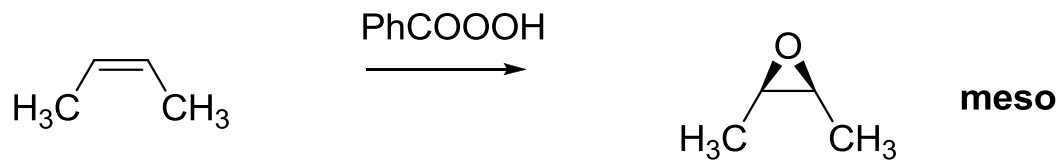
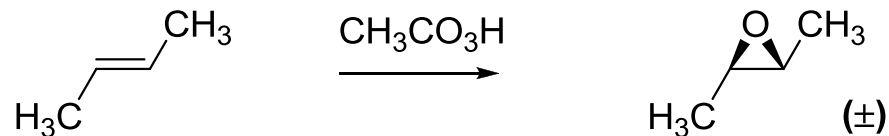
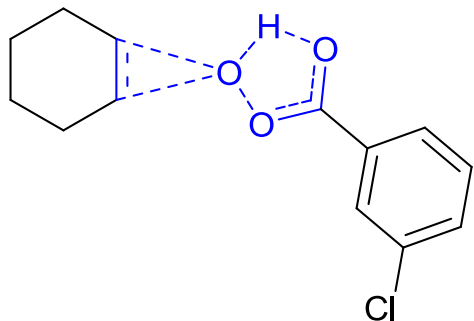
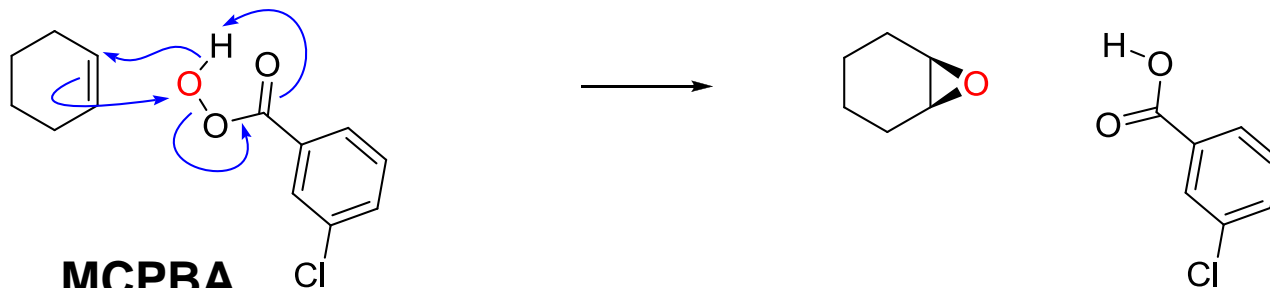




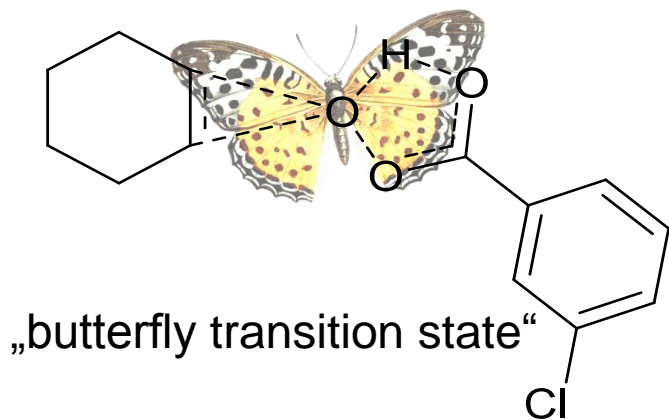
# Elektrofilní adice na dvojnou vazbu: adice $\text{Br}_2$ ; konjugovaný dien



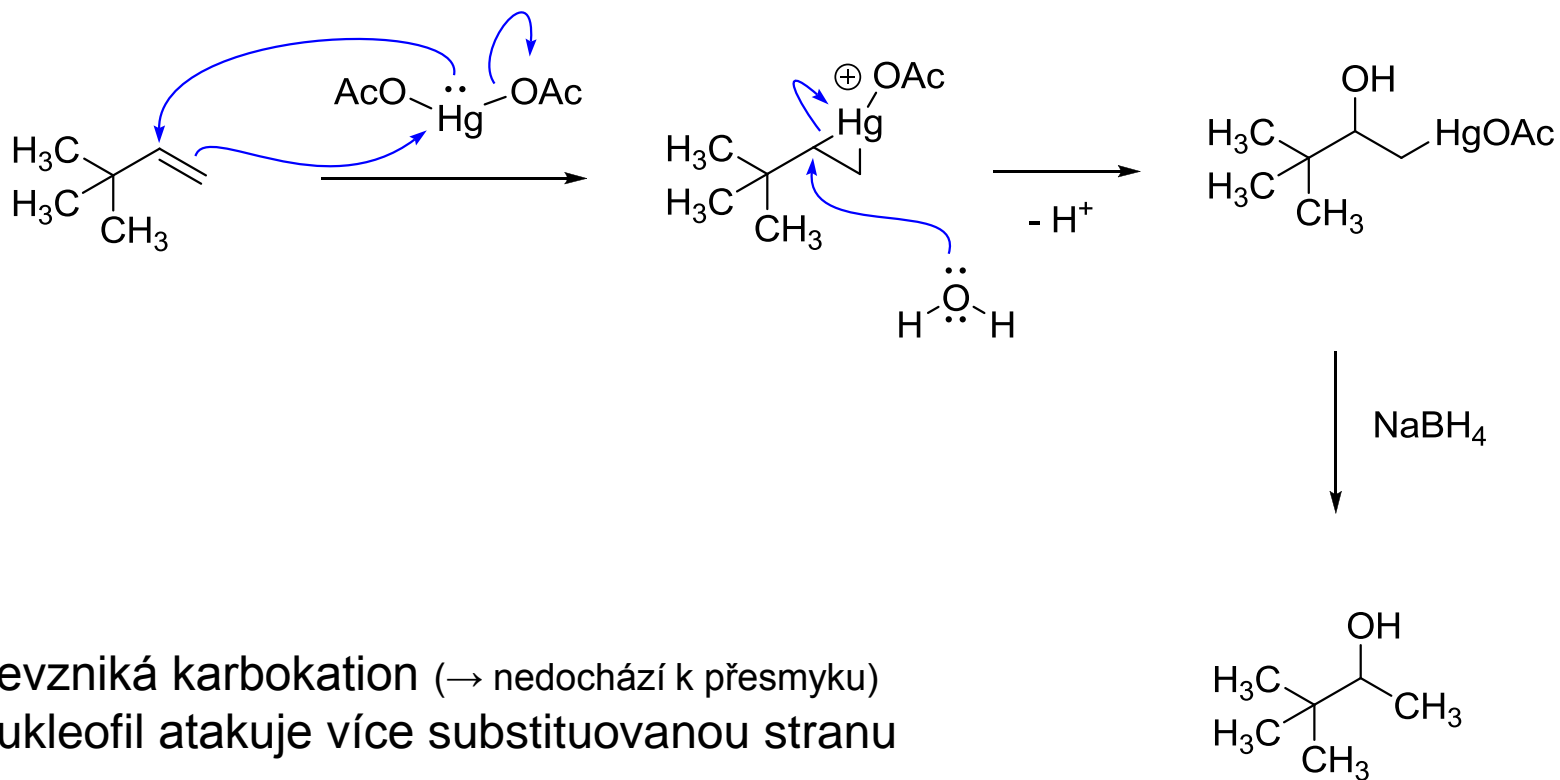
## Elektrofilní adice na dvojnou vazbu: epoxidace



stereospecifická reakce



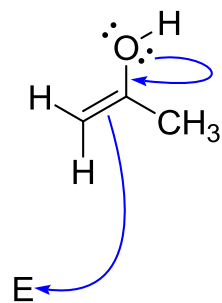
## Elektrofilní adice na dvojnou vazbu: **oxymerkurace**



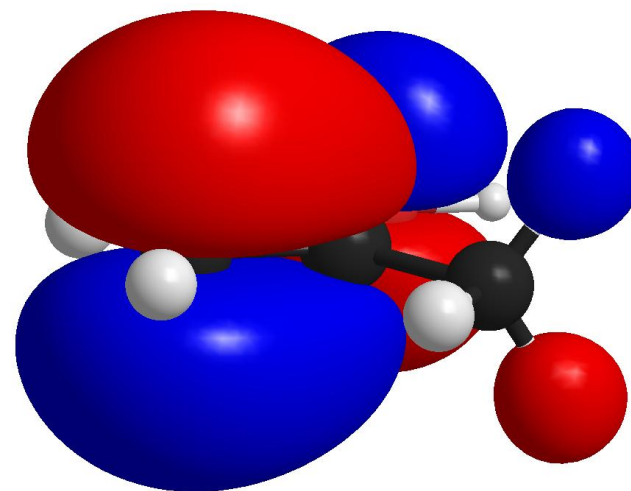
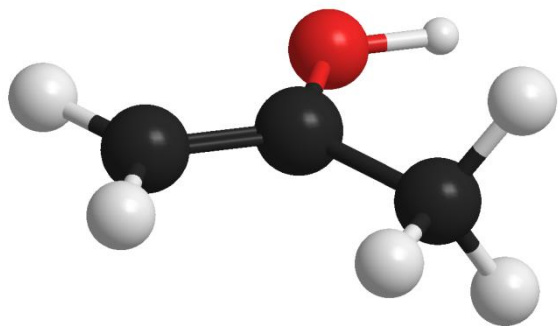
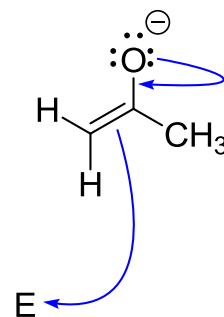
- nevzniká karbokation ( $\rightarrow$  nedochází k přesmyku)
- nukleofil atakuje více substituovanou stranu

# Reakce enolů a enolátů

**ENOL**

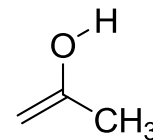
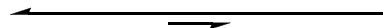
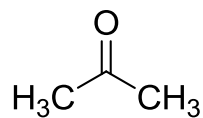


**ENOLÁT**

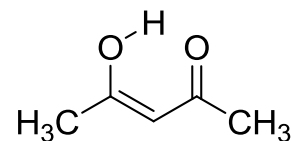
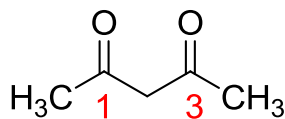


HOMO

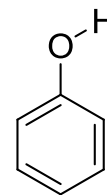
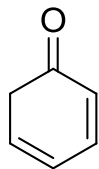
**% enolu  
ve vodě**



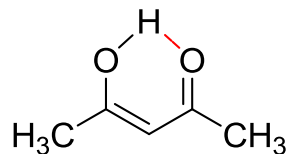
**$2.5 \times 10^{-4}$**



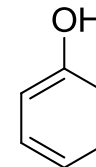
**20**



**100**

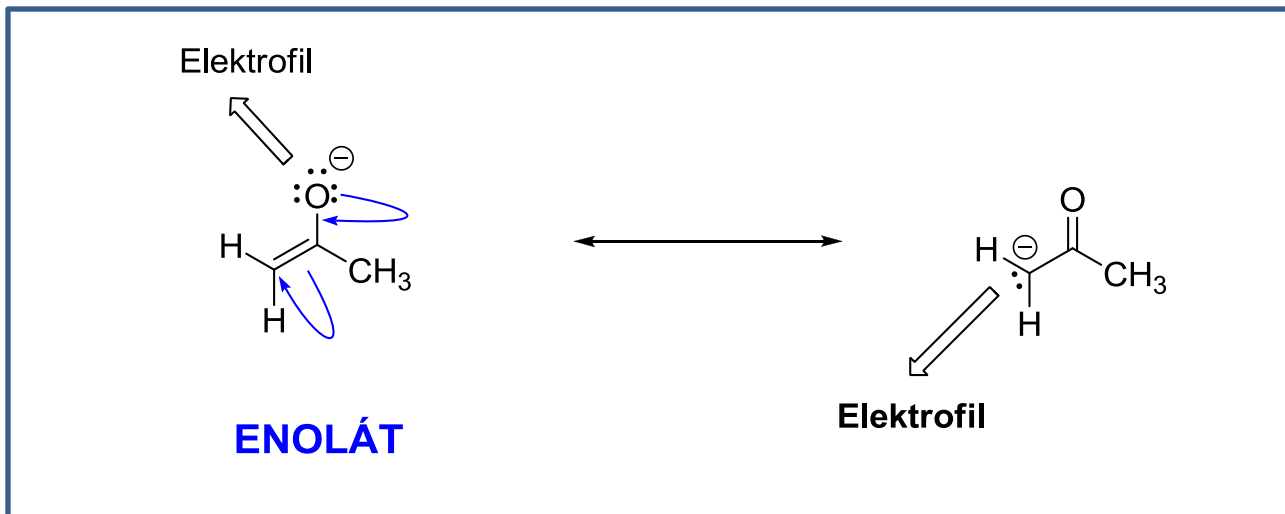
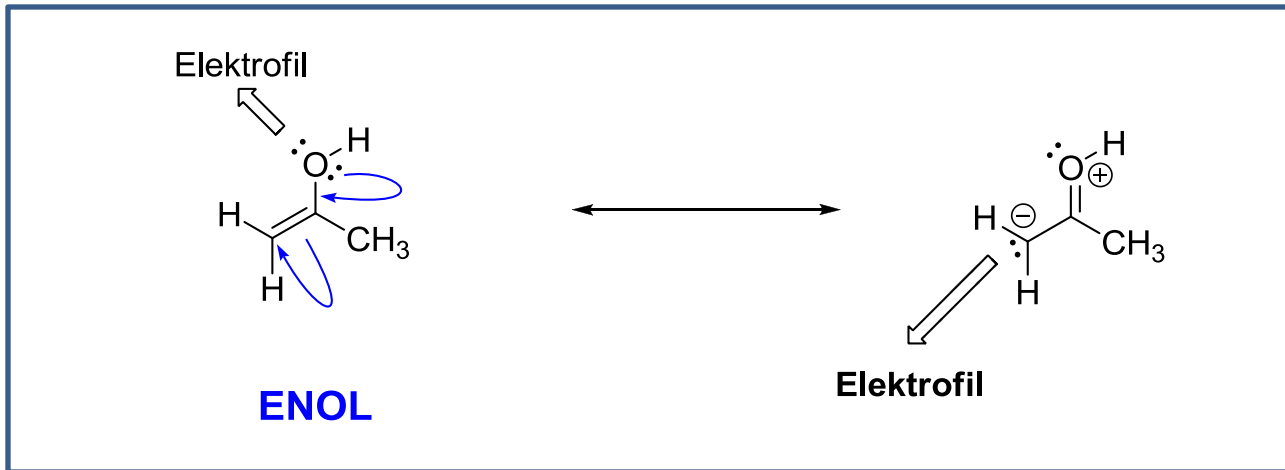


**konjugace  
intramolekulární vodíková vazba**



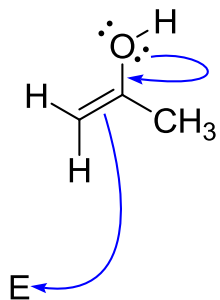
**aromatický enol**

# Reakce enolů a enolátů

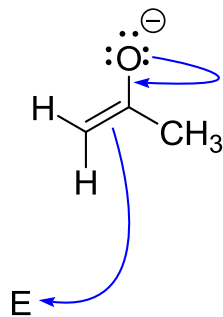


# Reaktivita dvojn  vazby

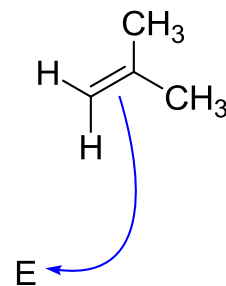
ENOL



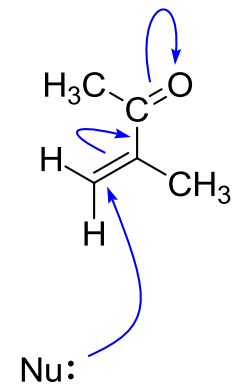
ENOL T



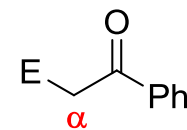
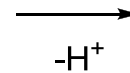
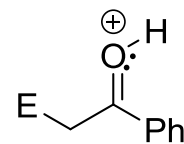
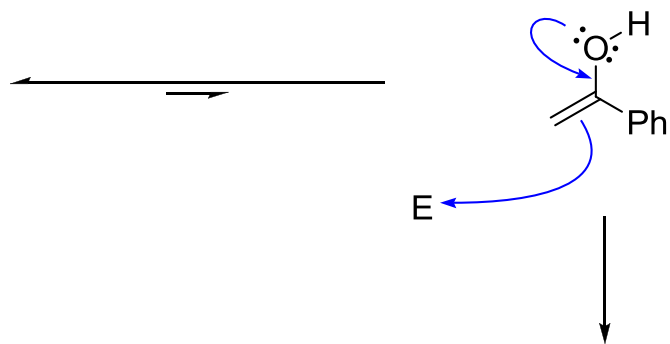
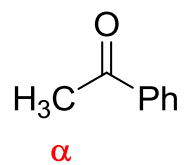
IZOLOVAN   
DVOJN  VAZBA



$\alpha,\beta$ -NENASYCEN   
KARBONYL



# Minoritní složka směsi může reagovat



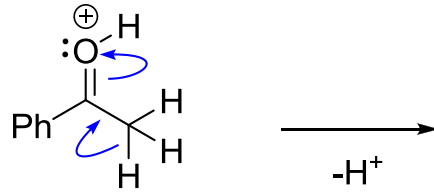
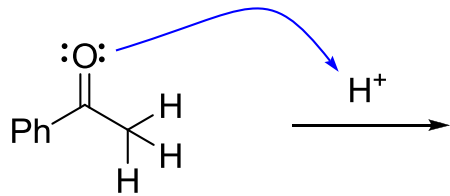
% enolu  
ve vodě

$10^{-4}$

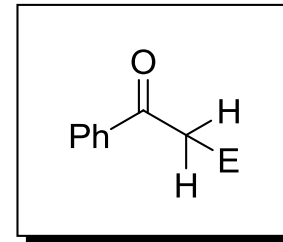
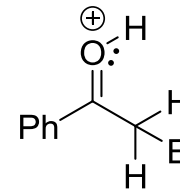
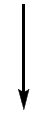
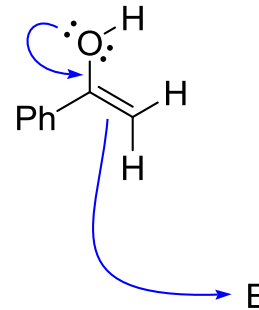


# JAK ZVÝŠIT KONCENTRACI ENOLU/ENOLÁTU?

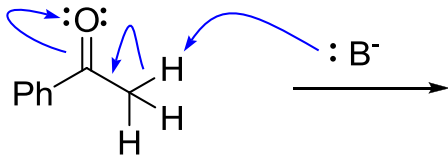
## Kyselá katalýza



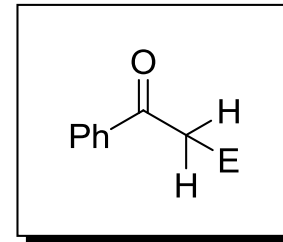
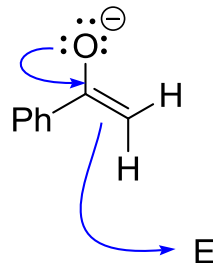
## ENOL



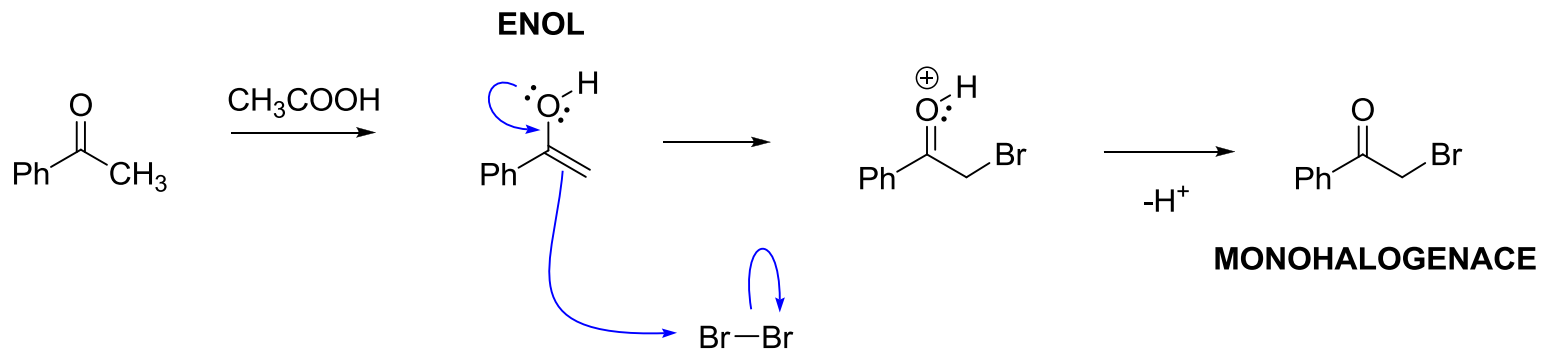
## Bazická katalýza



## ENOLÁT

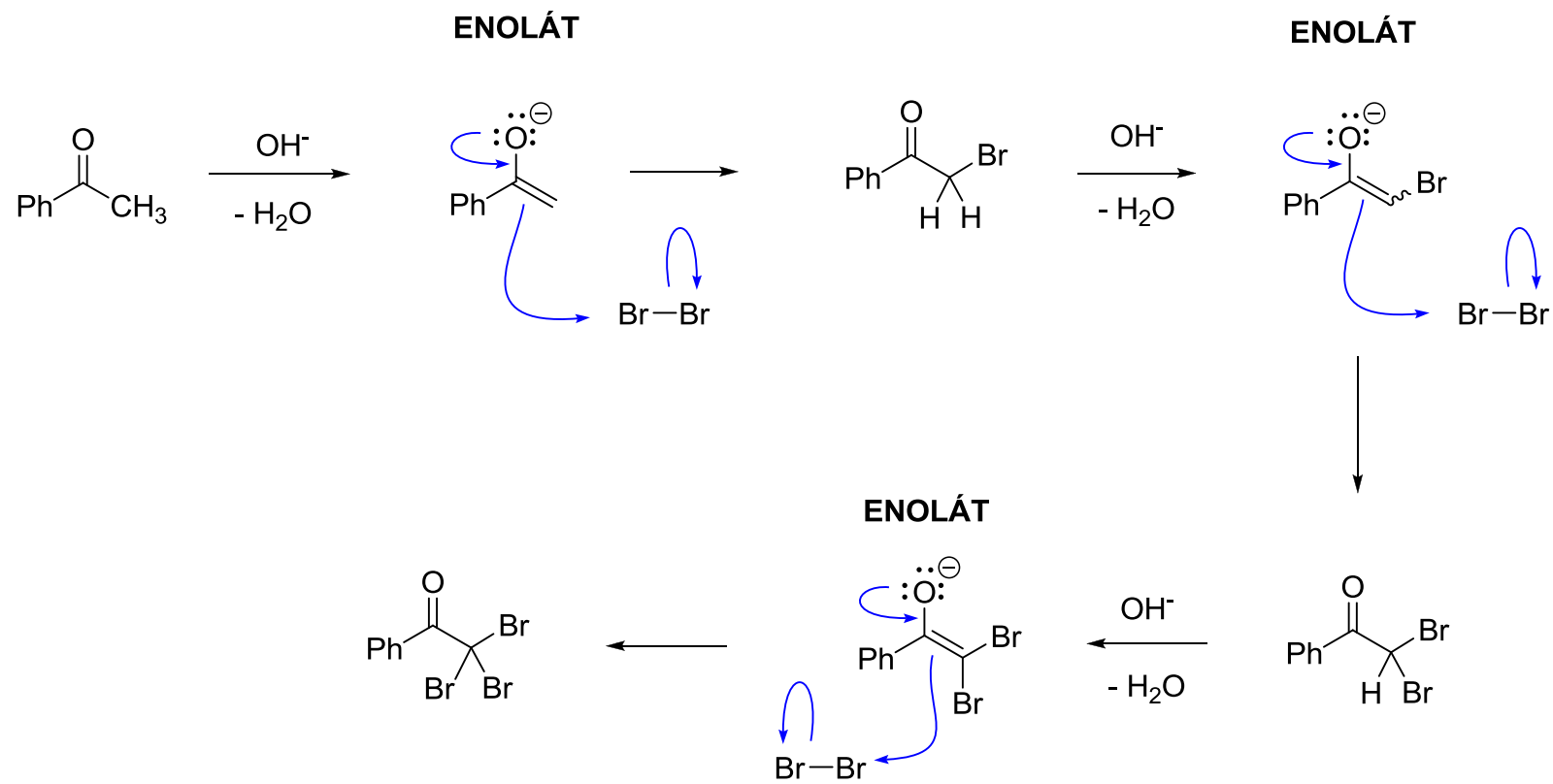


## Kysele

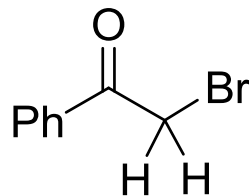


## HALOGENACE

## Bazicky

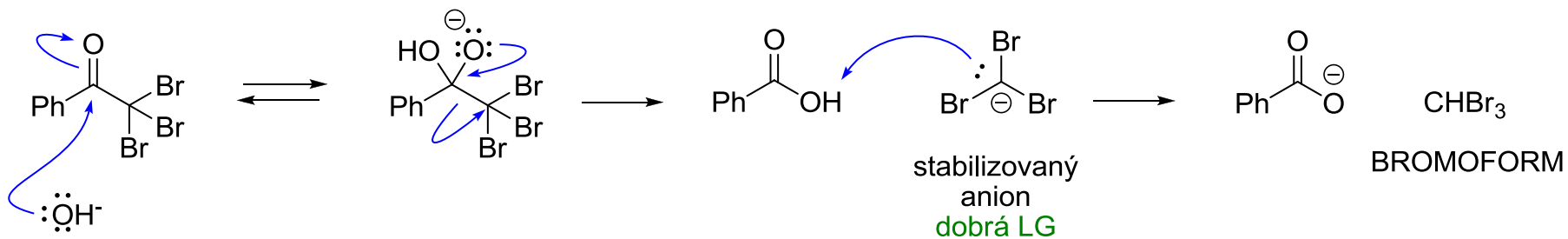


## BAZICKY KATALYZOVANÁ HALOGENACE



- Halogenací alfa-polohy se (díky indukčnímu efektu) atomy vodíku, které zůstávají v této poloze, **stávají kyselejšími**.
- Je-li ve směsi **přebytek** halogenu, dojde k **úplné halogenaci** alfa polohy.
- Použijeme-li 1 ekvivalent halogenu, často získáme směs mono-, di- a trihalogenovaného produktu.
- Chceme-li do alfa polohy dostat jeden atom halogenu, je lepší kysele katalyzovaná reakce.

# HALOFORMOVÁ REAKCE



srovnáme s podobnou reakcí:

