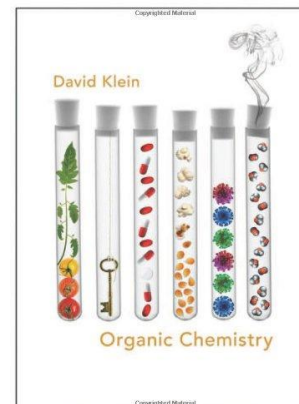
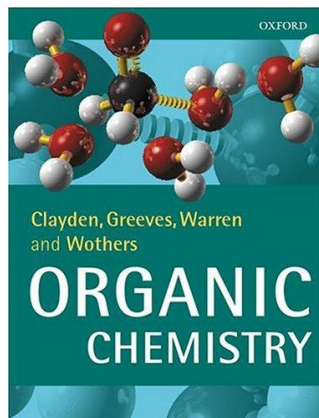
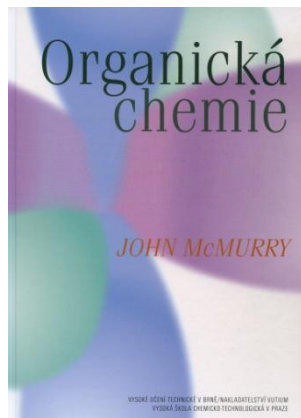


# Organická Chemie II

1. Aplikace konceptů reaktivity z Organické chemie I
2. Přehled reaktivity základních funkčních skupin
3. Úvod do plánování syntetické strategie – organická syntéza



# Organická Chemie II

1. Poznámky z přednášek a seminářů jsou základ.
2. Doporučená literatura (McMurry; Clayden).
3. Řešení problémů (McMurry; Literák).
4. Diskuse s ostatními studenty.
5. Průběžná příprava.

## Zápočet

- $\geq 50$  bodů ze 3 průběžných testů (45 min.; celkem 100 bodů)
- 2 opravné zápočtové testy

## Zkouška

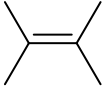
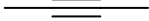
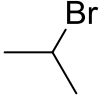
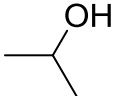

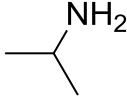

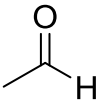

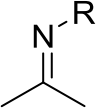
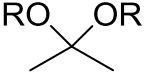

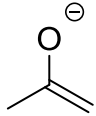

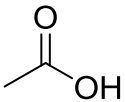
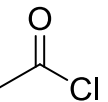
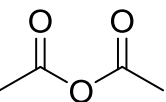
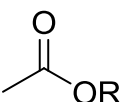
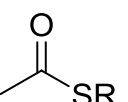
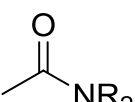
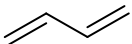
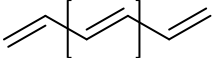

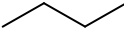
- udělený zápočet je podmínkou
- 4 písemné zkouškové testy (120 min; 100 bodů)
  - 5.1. (řádný)
  - 12.1. (řádný + opravný)
  - 19.1. (řádný + opravný)
  - 2.2. (opravný)

## Konzultace

- ihned po přednášce (cca 20 min)
- individuálně s vedoucími seminářů (Slávka Janků, Jaromír Literák, Ondřej Hylse)

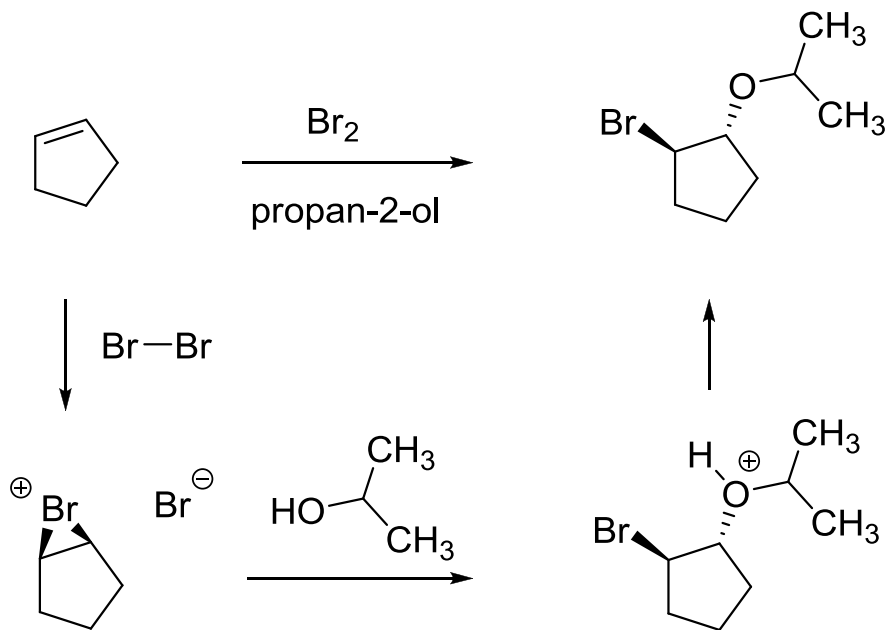
|    | <b>Datum</b> | <b>Téma</b>                    | <b>Literatura</b><br>[M = McMurry]   |
|----|--------------|--------------------------------|--------------------------------------|
| 1  | 17.9.        | Alkeny a alkyny                | <i>M</i> : 169-274                   |
| 2  | 19.9.        | Alkeny a alkyny                |                                      |
| 3  | 24.9.        | Alkeny a alkyny                |                                      |
| 4  | 26.9.        | Alkoholy, thioly, aminy        | <i>M</i> : 317-392; 587-671; 892-909 |
| 5  | 1.10.        | Alkoholy, thioly, aminy        |                                      |
| 6  | 3.10.        | Alkoholy, thioly, aminy        |                                      |
|    | 8.10.        | Průběžný test 1                |                                      |
| 7  | 8.10.        | Aldehydy a Ketony              | <i>M</i> : 672-736                   |
| 8  | 10.10.       | Aldehydy a Ketony              |                                      |
| 9  | 15.10.       | Aldehydy a Ketony              |                                      |
| 10 | 17.10.       | Enoly a Enoláty                | <i>M</i> : 820-891                   |
| 11 | 22.10.       | Enoly a Enoláty                |                                      |
| 12 | 24.10.       | Enoly a Enoláty                |                                      |
| 13 | 29.10.       | Deriváty karboxylových kyselin | <i>M</i> : 737-819                   |

|    |        |                                |                               |
|----|--------|--------------------------------|-------------------------------|
| 14 | 31.10. | Deriváty karboxylových kyselin |                               |
| 15 | 5.11.  | Deriváty karboxylových kyselin |                               |
|    | 7.11.  | Průběžný test 2                |                               |
| 16 | 7.11.  | Dieny a polyeny                | <i>M</i> : 464-497; 1134-1158 |
| 17 | 12.11  | Dieny a polyeny                |                               |
| 18 | 14.11. | Dieny a polyeny                |                               |
| 19 | 19.11. | Aromatické sloučeniny          | <i>M</i> : 498-586; 915-922   |
| 20 | 21.11. | Aromatické sloučeniny          |                               |
| 21 | 26.11. | Aromatické sloučeniny          |                               |
| 22 | 28.11. | Alkany                         |                               |
| 23 | 3.12.  | Alkany                         |                               |
| 24 | 5.12.  | Alkany                         |                               |
|    | 10.12. | Průběžný test 3                |                               |
| 25 | 10.12. | TBA                            |                               |
| 26 | 12.12. | TBA                            |                               |
| 27 | 17.12. | TBA                            |                               |
| 28 | 19.12. | TBA                            |                               |

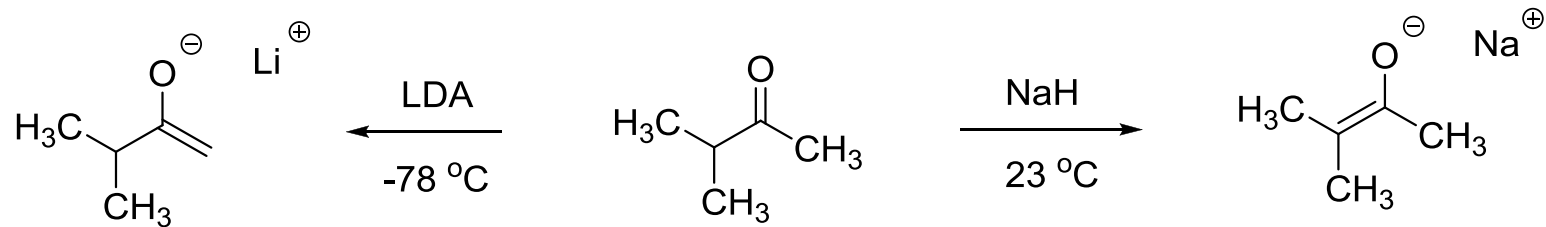
1.  CC(C)=C  
alken
1.  C#C  
alkyn
2.  CCBr  
alkylhalogenid
2.  CCO  
alkohol
2.  CCS  
thiol
2.  CCN  
amin
2.  C1CO1  
epoxid
3.  CC=O  
aldehyd
3.  CC(=O)C  
keton
3.  CC=N-R  
imin
3.  CC(OR)2  
acetal
4.  CC(O)=C  
enol
4.  CC([O-])=C  
enolát
4.  CC(NR2)=C  
enamin
5.  CC(=O)O  
karboxylová kyselina
5.  CC(=O)Cl  
acylchlorid
5.  CC(=O)OC(=O)C  
anhydrid
5.  CC(=O)OR  
ester
5.  CC(=O)SR  
thioester
5.  CC(=O)NR2  
amid
6.  C=CC=C  
dien
6.  C=CC=CC=C  
polyen
7.  c1ccccc1  
aryl
8.  CCCC  
alkan

**Reaktivitu organických molekul lze často odhadnout na základě přítomných funkčních skupin.**

# 1. Formální mechanismus a přesun elektronů ("arrow pushing")

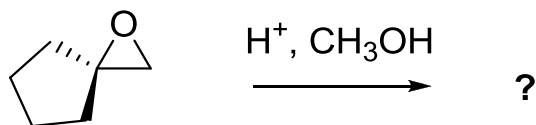


## 2. Interpretace reaktivity

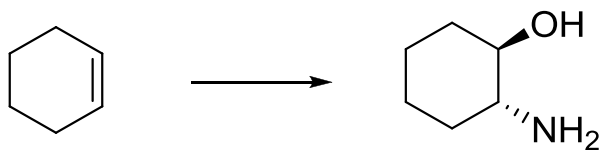




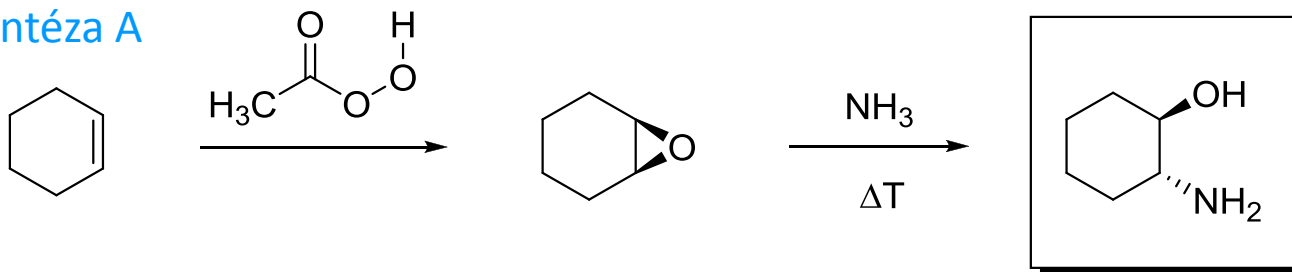
### 3. Predikce hlavního produktu reakce



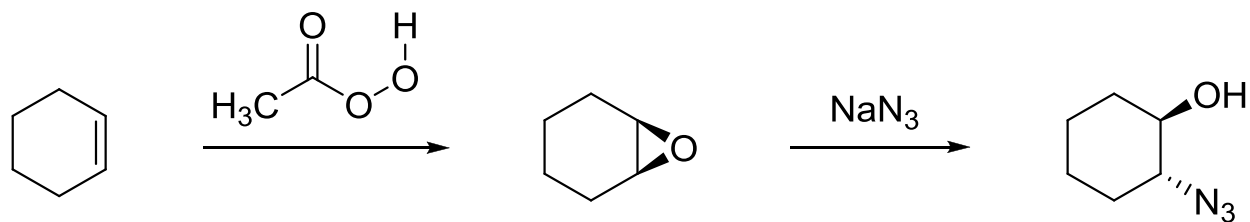
## 4. Návrh syntetické sekvence



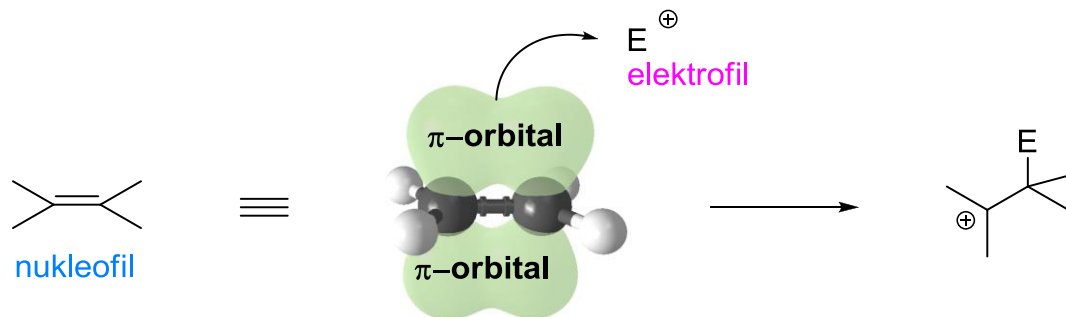
## Syntéza A



## Syntéza B



# 1. Alkeny a alkyny



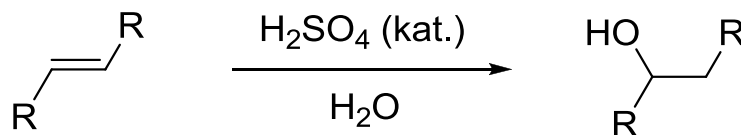


# 1. Alkeny a alkyny

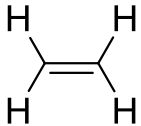
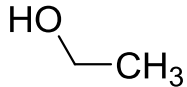
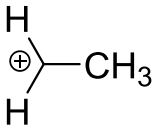
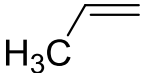
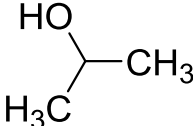
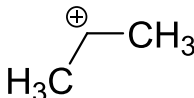
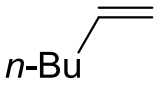
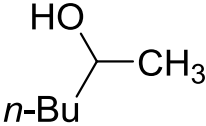
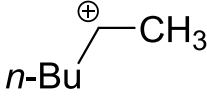
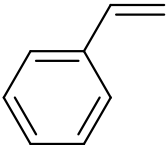
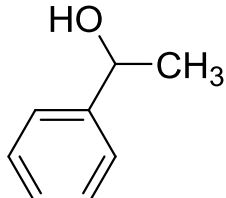
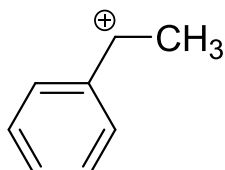
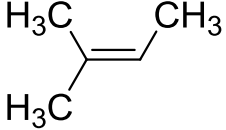
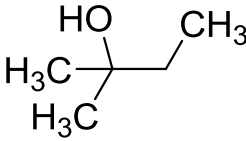
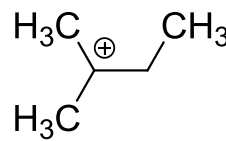
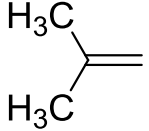
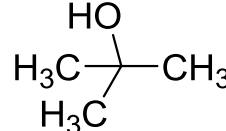
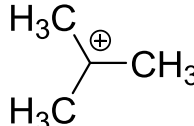
Důležité koncepty z Organické chemie I:

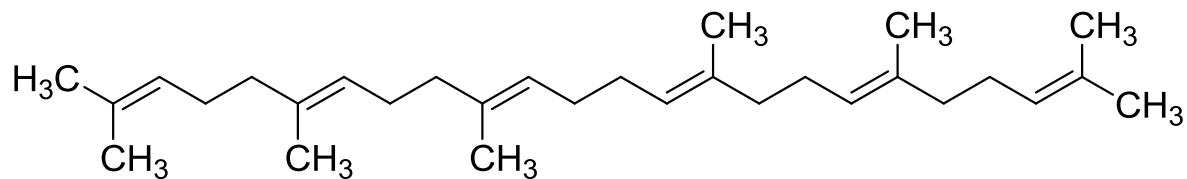
- elektronické a sterické efekty
- elektrofilní adice na alkeny/alkyny
- kyselá a bazická katalýza
- nukleofilní adice na karbonylovou skupinu
- SN2/SN1 reakce
- stabilita karbokationtů a radikálů
- keto-enol tautomerie
- stereoselektivita a regioselektivita; enantiomer, diastereomer
- termodynamika versus kinetika, reakční koordináta

Chwang, W. K. et al.  
JACS **1977**, *99*, 7233.

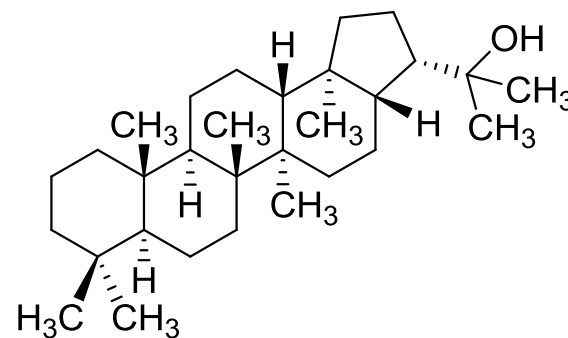
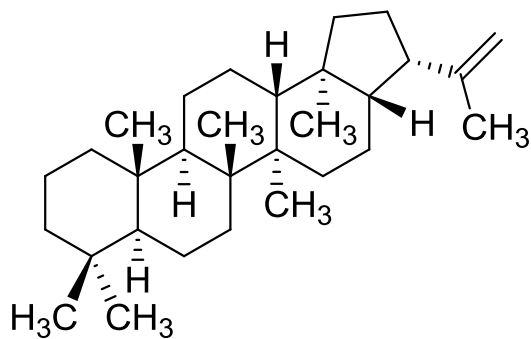


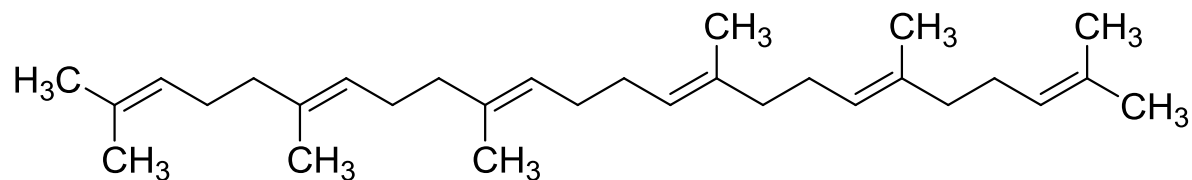
*tvorba karbokationtu  
je rychlost určující krok*

|   | $k_{\text{rel}}$ (rychlost) | Produkt  | Kation  |
|---|-----------------------------|--|---|
|    | 1 (reference)               |   |    |
|    | $1.6 \times 10^7$           |   |    |
|    | $3.0 \times 10^7$           |    |    |
|   | $1.6 \times 10^9$           |   |   |
|  | $1.5 \times 10^{12}$        |  |  |
|  | $2.5 \times 10^{12}$        |  |  |

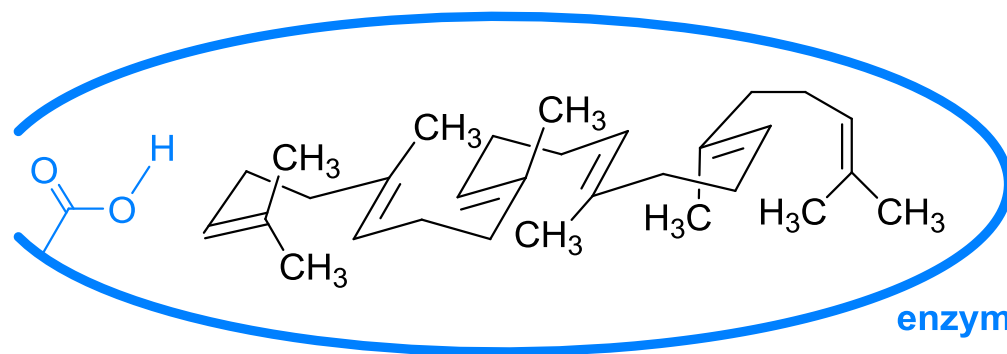


enzym, H<sup>+</sup>, H<sub>2</sub>O





lineární prekursor

lineární prekursor pre-organizovaný  
v komplexu s enzymem



