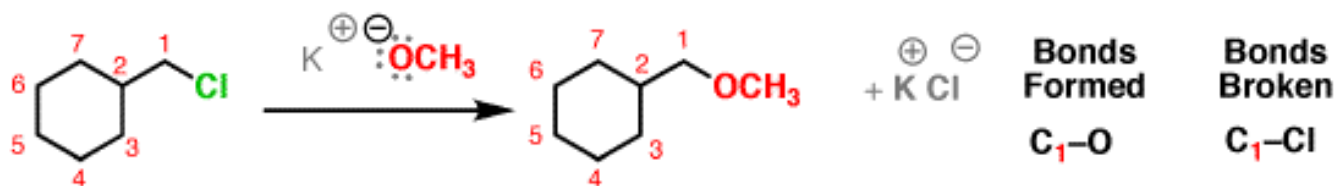
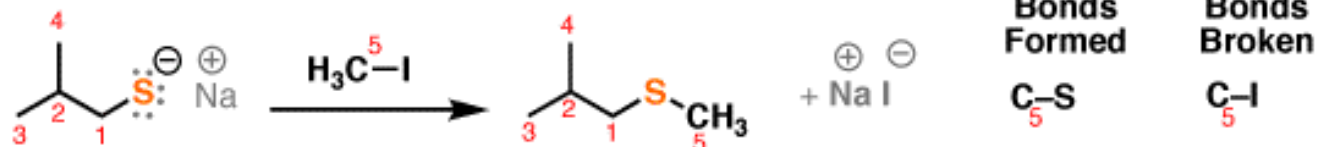


# Substitute

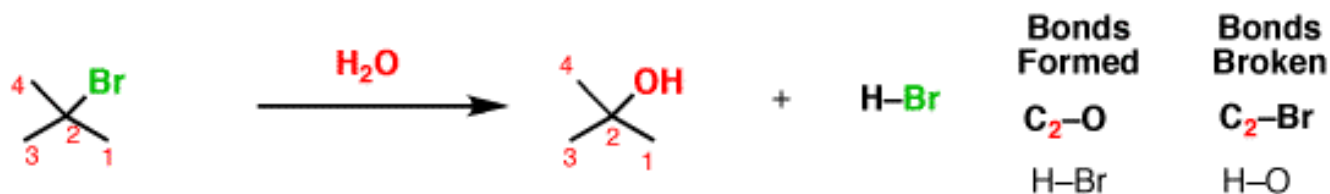
## Examples of substitution reactions



*numbering is not IUPAC*

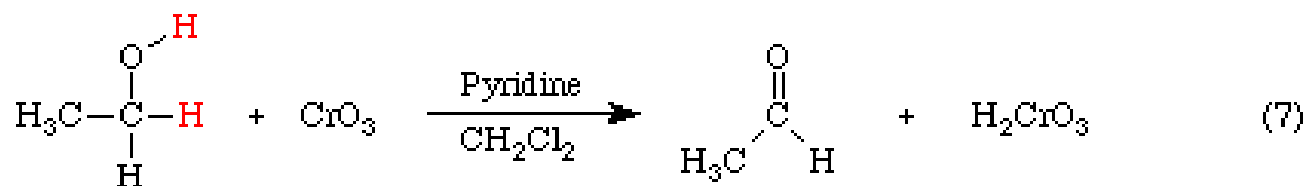
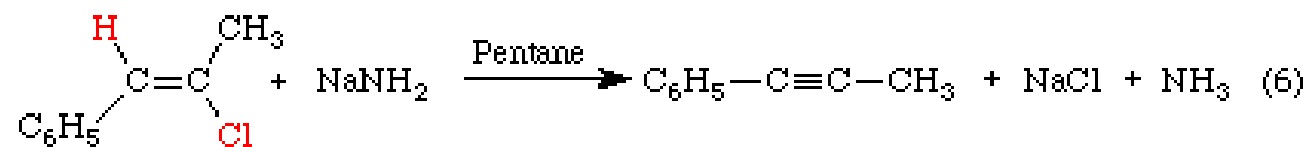
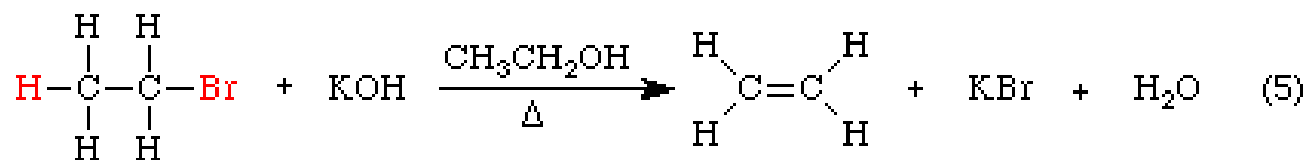


*numbering is not IUPAC*



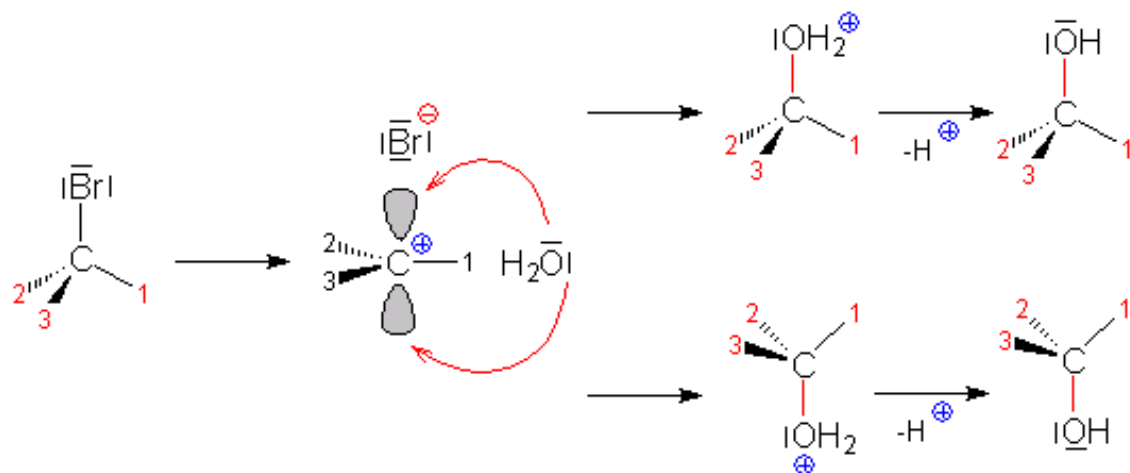
*note here than an acid-base reaction also occurs!*

# Eliminace

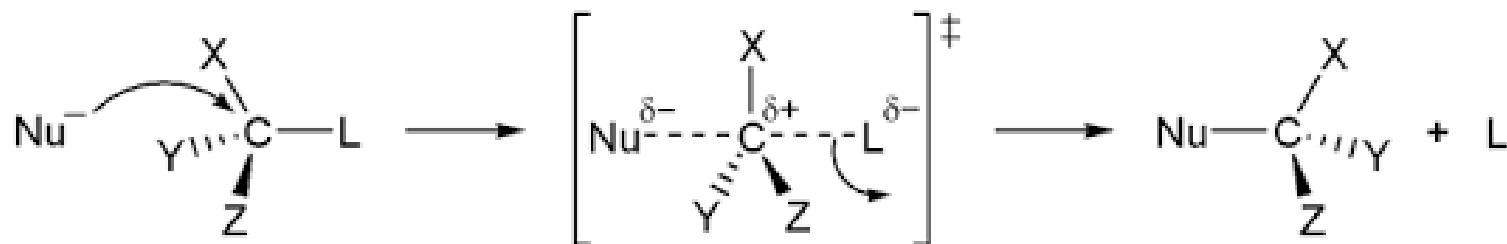


# Substitute

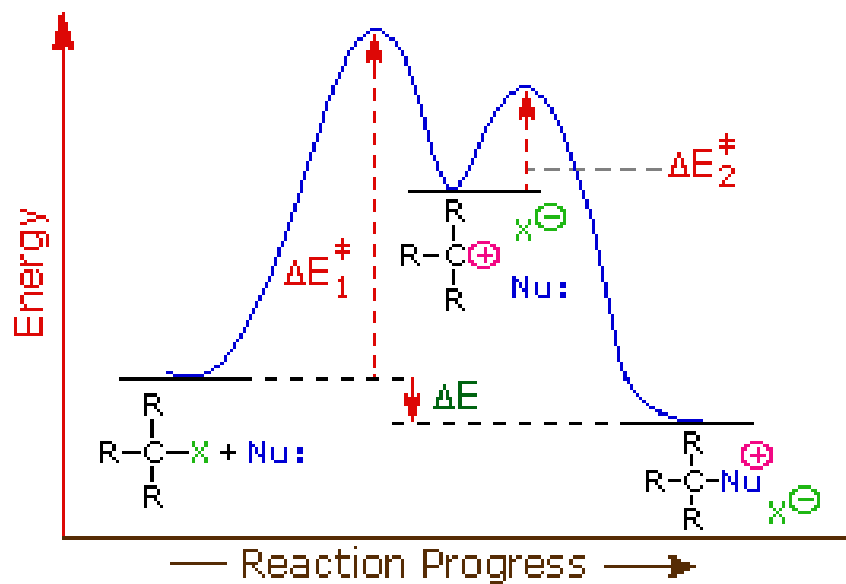
$S_N1$



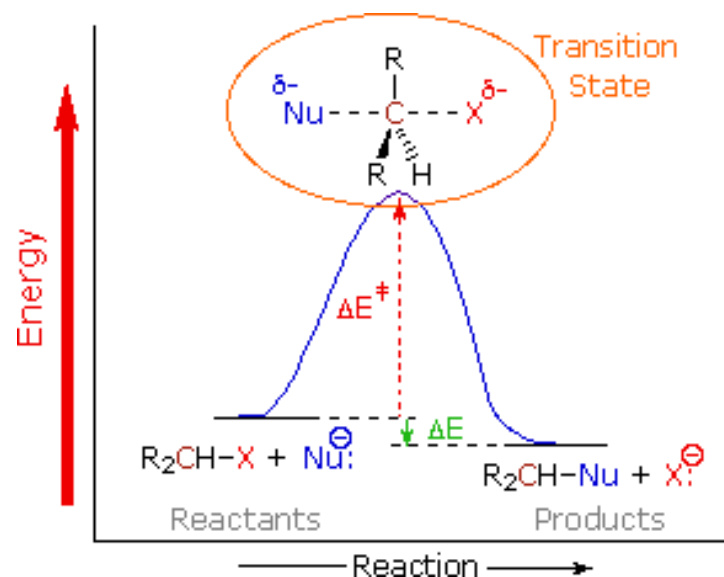
$S_N2$



# SN1

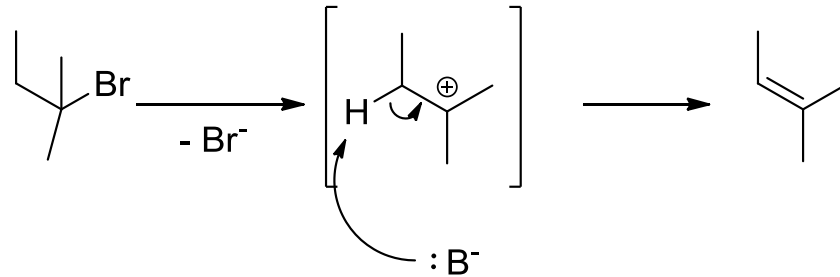


# SN2



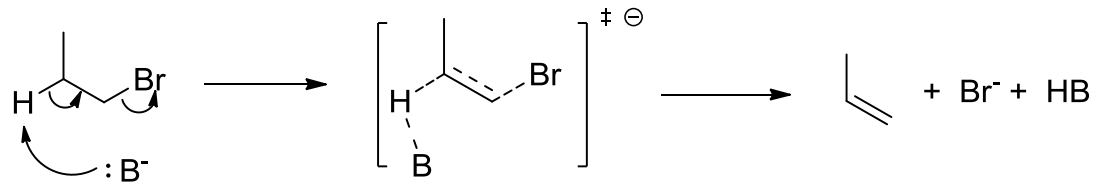
# Eliminace

E1

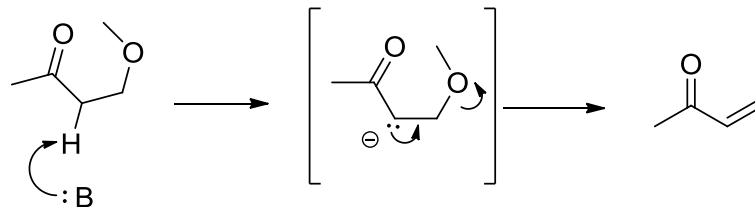


E2

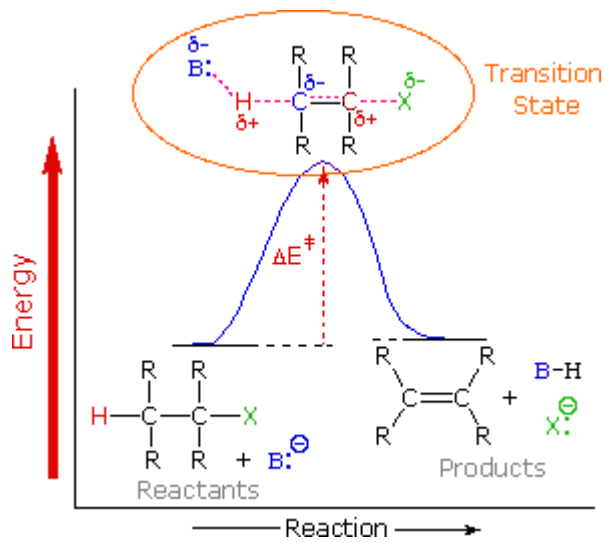
**Antiperiplanárně!**



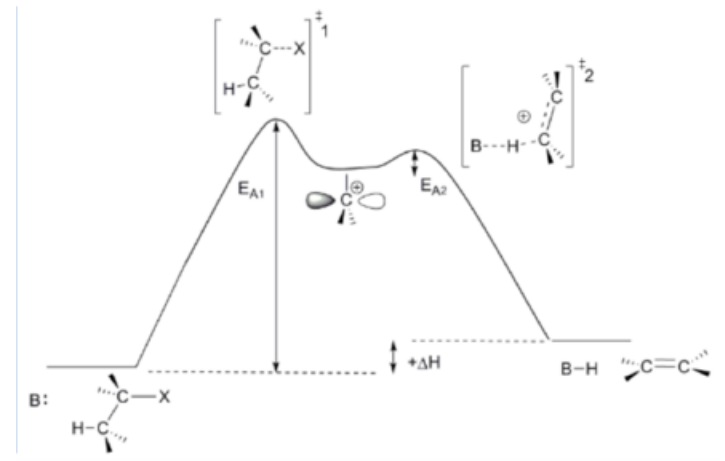
E1CB



# E2

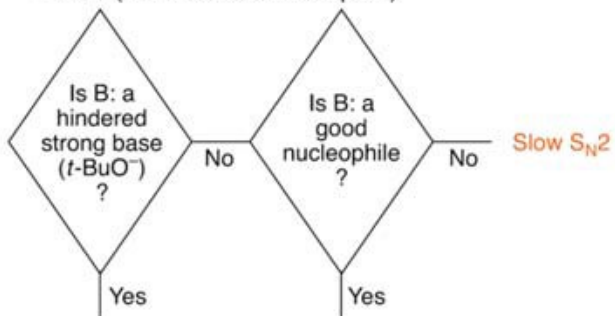


# E1



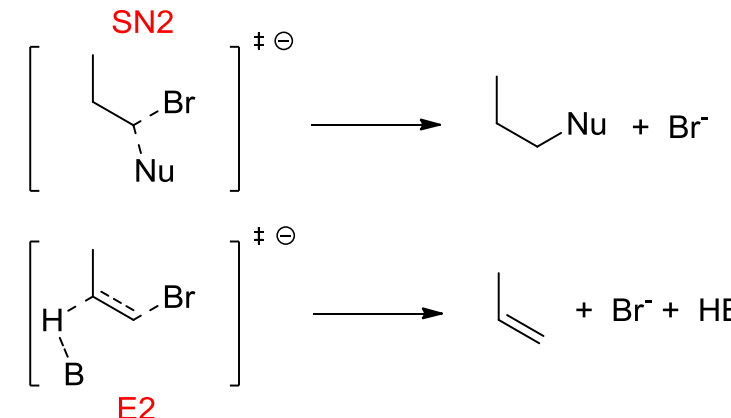
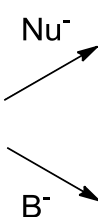
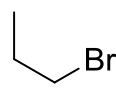
Reactions of R-LG (where LG is a good leaving group)  
with B: (a base and/or nucleophile)

R is primary  
and unhindered

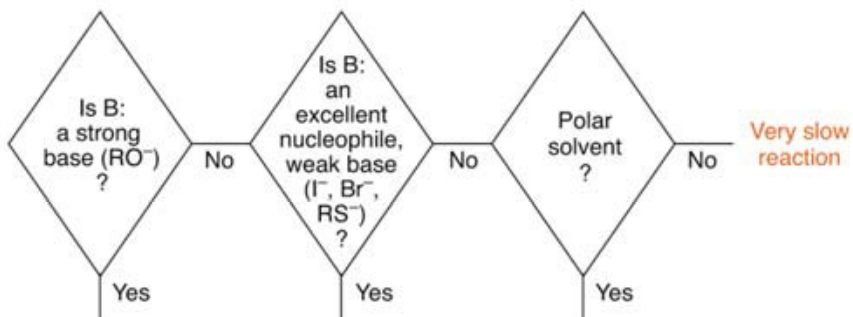


Alkene, E2

Rapid  $S_N2$



R is secondary



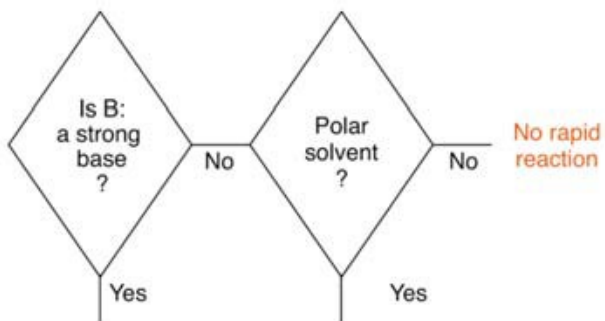
Alkene, E2

Moderately  
rapid  $S_N2$

Slow  $S_N1$

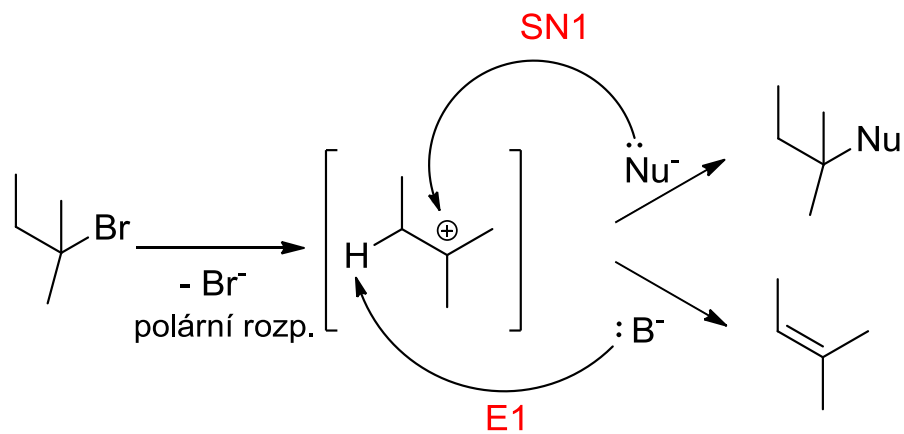
Very slow  
reaction

R is tertiary



Alkene produced  
E2 in nonpolar solvent  
E1 or E2 in polar solvent

Rapid  $S_N1$



# SN1 vs. SN2 vs. E1 vs E2

- Stéricky stíněný nukleofil/báze → **Eliminace**
- Čím **polárnější rozpoštědlo**, tím více podpoří vznik **karbokationtu**  
→ Podpoří **E1** a **SN1**
- Čím je **nukleofil silnější bázi** → tím více podpoří **Eliminaci**  
→ tím více podpoří **E2** oproti E1
- Čím je **nukleofil měkčí** → tím více podpoří **Substituci**
- Čím je **nukleofil silnější** → tím více podpoří **SN2** oproti SN1
- Čím je **vyšší teplota** → tím více je podpořena **Eliminace**



# SN1 vs. SN2 vs. E1 vs E2

- Čím více **rozvětvený substrát** → tím více se podpoří **Eliminace**
- Čím **lepší odstupující skupina** + čím **stabilnější karbokation** může vzniknout → tím více jsou podpořeny **SN1** a **E1** oproti SN2 a E2

