

# Draw the reaction coordinate diagram.

One Step  
 $\Delta G = +15$

$$E_a = +30$$

Two Steps

$$\Delta G = -5$$

$$\Delta G_1 = +12$$

$$\Delta G_2 = -17$$

$$E_{a1} = +18$$

$$E_{a2} = +10$$

# Reaction Rates



Overall rate

Double [RX]

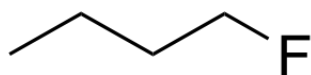
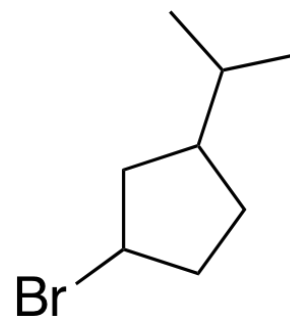
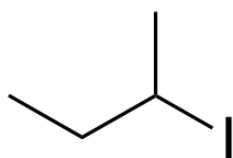
Half [OH<sup>-</sup>]

Double all reactant  
conc.

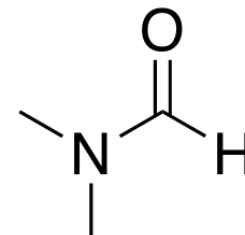
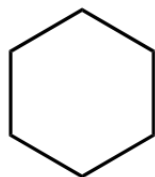
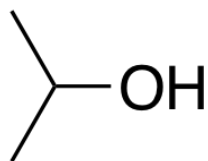
Half solvent amount

Triple solvent  
amount

# Name the alkyl halide.



Identify the type of solvent.

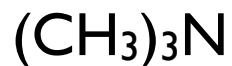
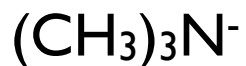
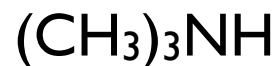
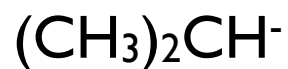


What concepts from previous chapters  
are coming up so far in Chapter 7?

# Choose the stronger nucleophile.

Choice

Why?



p.a.



p.p.



# Nucleophile Breakdown

Fantastic!	Good	Not so good
$\text{RS}^-$	$\text{Br}^-$	$\text{F}^-$
$\text{NC}^-$	$\text{R}_2\text{S}$	$\text{HCO}_3^-$
$\text{I}^-$	$\text{NR}_3$	$\text{R}_2\text{O}$
$\text{PR}_3$	$\text{Cl}^-$	
$\text{R}_3\text{C}^-$	$\text{RCO}_2^-$	
$\text{R}_2\text{N}^-$	$\text{N}_3^-$	
$\text{RC}\equiv\text{C}^-$		
$\text{RO}^-$		

\* Also good bases. Making bond with C will be in competition with stealing H

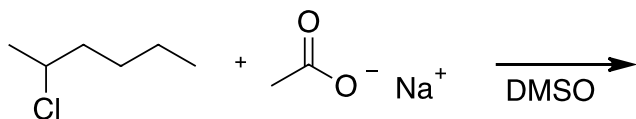
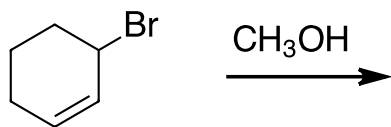
# True or False?

- All good bases are good nucleophiles.
  
- All good nucleophiles are good bases.



**We need some volunteers!**

Draw the expected substitution products.



Reaction of cyanide ion with *n*-iodoheptane

Reaction of ethanol with 2-bromo-2-methylbutane