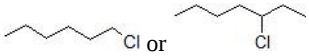
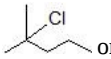
7.22: ADDITIONAL EXERCISES

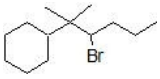
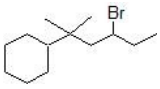
SN2

7-1 Predict which compound in each pair would undergo the SN2 reaction faster.

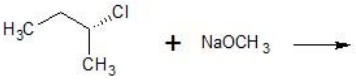
a)  or

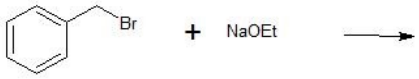
b)  or 

c)  or 

d)  or 

7-2 Predict the products of these nucleophilic substitution reactions, including stereochemistry when appropriate.

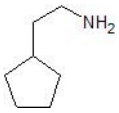
a) 

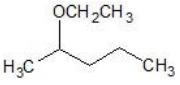
b) 

c) $CH_3CH_2C(CH_3)_2Cl$ + NaCN →

d) (S)-2-bromopentane + sodium hydroxide →

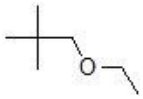
7-3 Show how each compound might be synthesized using S_N2 reaction.

a) 

b) 

c) 

7-4 Show 2 ways to synthesize the ether below using S_N2 reaction



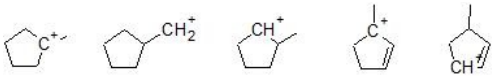
7-5 Of the two ways of synthesizing the compound in previous question (**7-4**), which one would be the most efficient? Why? Show the mechanism of the reaction as part of your explanation.

7-6 Arrange the compounds below in increasing order of nucleophilicity.

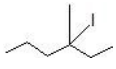
H_2O; NH_2^-; CH_3O^-; $CH_3CH_2O^-$

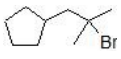
SN1

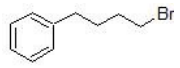
7-7 List the following carbocations in order of increasing stability.

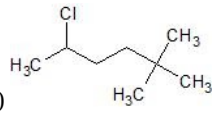


7-8 Give the solvolysis product expected when the compound is heated in methanol.

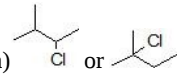
a) 

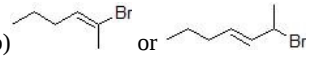
b) 

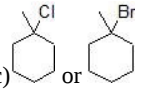
c) 

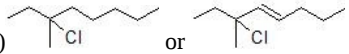
d) 

7-9 Predict with compound in each pair will undergo an SN1 reaction more quickly.

a) 

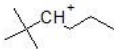
b) 

c) 

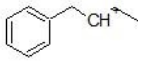
d) 

7-10 Show how the following carbocations would rearrange to become more stable. Draw the mechanism of the rearrangement.

a) 

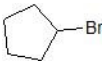
b) 

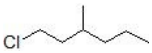
c) 

d) 

SN2 VS SN1

7-11 Predict whether each compound below would be more likely to undergo a S_N2 or S_N1 reaction.

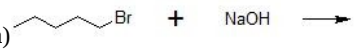
a) 

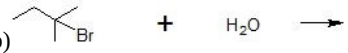
b) 

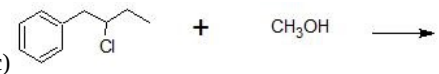
c) 

d) 

7-12 Predict the product of the following reactions.

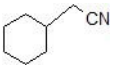
a) 

b) 

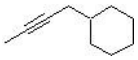
c) 

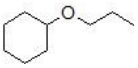
d) 

7-13 Show how each compound may be synthesized using nucleophilic substitution reactions.

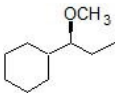
a) 

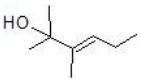
b) 

c) 

d) 

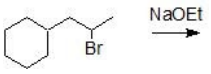
e) 

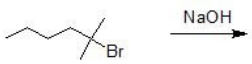
f) 

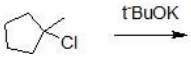
g) 

E2 VS E1

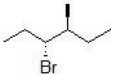
7-14 Predict the major products of the following reactions.

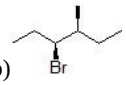
a) 

b) 

c) 

7-15 Draw the expected major product when each of the following compounds is treated with hydroxide to give an E2 reaction.

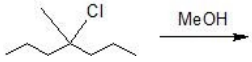
a) 

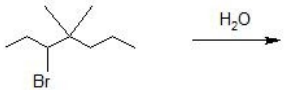
b) 

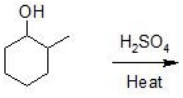
c) 

7-16 Predict all the elimination products of the following reactions and label the major product.

a) 

b) 

c) 

d) 

SUBSTITUTION VS ELIMINATION

7-17 Identify the function of the following reagents. The reagents will be a strong/weak nucleophile and/or a strong/weak base.

a) Cl^-

b) NaH

c) t-BuO^-

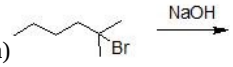
d) OH^-

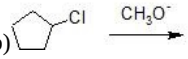
e) H_2O

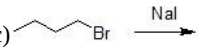
f) HS^-

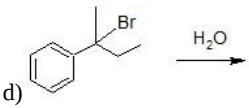
g) MeOH

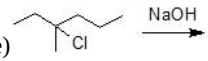
7-18 Identify which mechanism the following reactions would undergo.

a) 

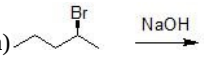
b) 

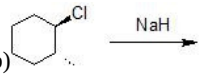
c) 

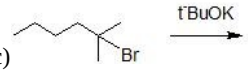
d) 

e) 

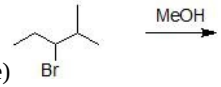
7-19 Identify all the products of the following reactions and specify the major product.

a) 

b) 

c) 

d) 

e) 

7-20 The following reaction yields five different products. Give the mechanisms for how each is formed.