Problem 11.4

What product would you expect from S_N2 reaction of 1-bromobutane with each of the following?

(a) NaI (b) KOH (c) $H-C\equiv C-Li$ (d) NH_3

Problem 11.12

3-Bromo-1-butene and 1-bromo-2-butene undergo S_N1 reaction at nearly the same rate even though one is a secondary halide and the other is primary. Explain.

Problem 11.27

Which compound in each of the following pairs will react faster in an S_N2 reaction with OH^-?

(a) CH_3Br or CH_3I

(b) CH_3CH_2I in ethanol or in dimethyl sulfoxide

(c) $(CH_3)_3CCl$ or CH_3Cl

(d) $H_2C{=}CHBr$ or $H_2C{=}CHCH_2Br$

Problem 11.31

How might you prepare each of the following molecules using a nucleophilic substitution reaction at some step?

(a) $CH_3C\equiv CCH(CH_3)CH_3$ (b) $CH_3-O-C(CH_3)_2CH_3$ (c) $CH_3CH_2CH_2CH_2CN$ (d) $CH_3CH_2CH_2NH_2$

Problem 11.33

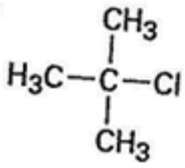
Predict the product and give the stereochemistry resulting from reaction of each of the following nucleophiles with (*R*)-2-bromooctane:

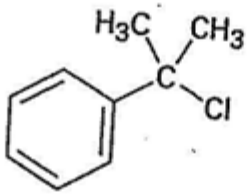
(a) ^-CN (b) $CH_3CO_2^-$ (c) CH_3S^-

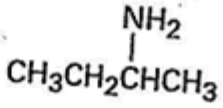
Problem 11.41

Order each of the following sets of compounds with respect to SN_1 reactivity:

(a)

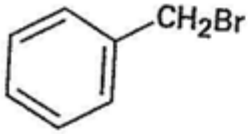


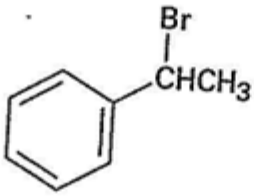


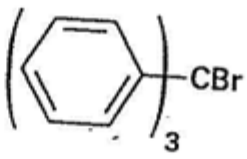


(b) $(CH_3)_3CCl$ $(CH_3)_3CBr$ $(CH_3)_3COH$

(c)



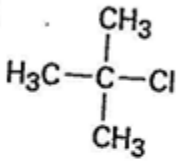




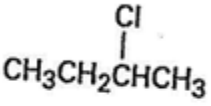
Problem 11.42

Order each of the following sets of compounds with respect to SN_2 reactivity:

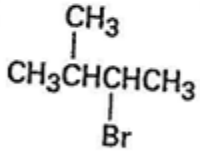
(a)

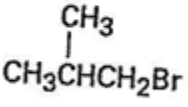


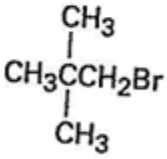
$CH_3CH_2CH_2Cl$



(b)



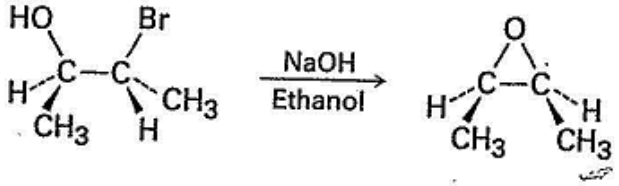




(c) $CH_3CH_2CH_2OCH_3$ $CH_3CH_2CH_2OTos$ $CH_3CH_2CH_2Br$

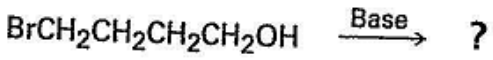
Problem 11.45

We saw in Section 8.7 that bromohydrins are converted into epoxides when treated with base. Propose a mechanism, using curved arrows to show the electron flow.



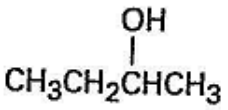
Problem 11.47

In light of your answer to Problem 11.45, what product might you expect from treatment of 4-bromo-1-butanol with base?



Problem 11.57

(S)-2-Butanol slowly racemizes on standing in dilute sulfuric acid. Explain.



2-Butanol