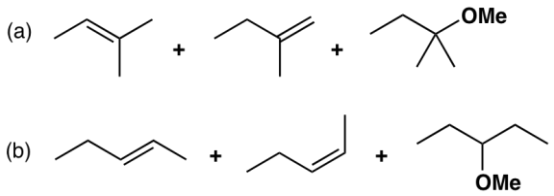
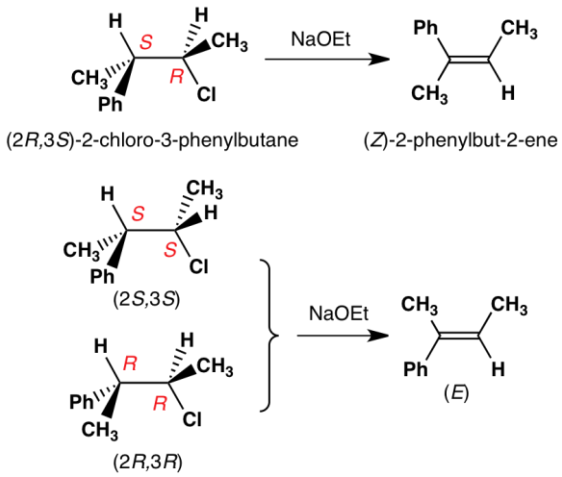
Solutions to Exercises, Chapter 13

13.1

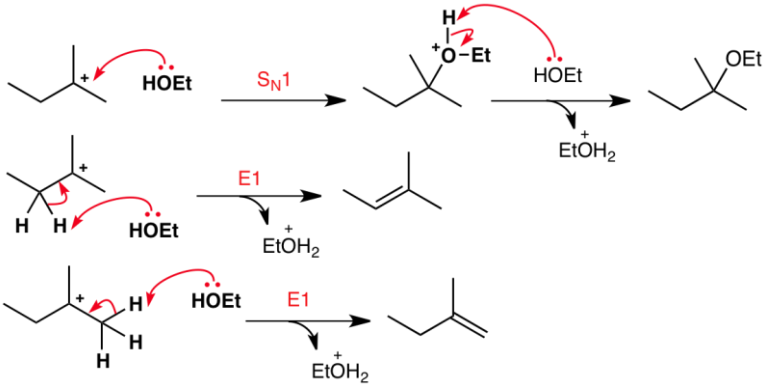


13.2



13.3 The E2 mechanism will be E1-like [path (b)] when the α C has an electron-donating group to stabilize the developing positive charge in the TS. In contrast, an electron-withdrawing group on the β C would make the E2 mechanism E1cB-like [path (c)] by stabilizing developing negative charge in the TS.

13.4

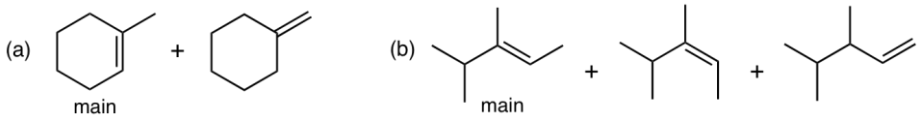


13.5

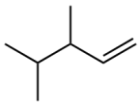
(a) (*E*)-But-2-ene (the more stable of the disubstituted alkenes).

(b) 2-Methylbut-2-ene (the more substituted/stable of the two alkenes).

13.6

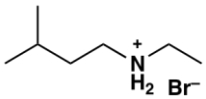


(c) and (d) The same alkenes as in (b) are possible, but the main product is the terminal alkene in both reactions for steric reasons.

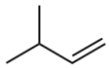


13.7

(a) A relatively nucleophilic amine and a 1^o alkyl bromide in a polar aprotic solvent lead mainly to *N*-ethyl-3-methylbutan-1-ammonium bromide by the S_N2 mechanism.



(b) A sterically hindered strong base gives mainly 3-methylbut-1-ene by the E2 mechanism.



13.8

(a) $CH_3CH_2CH_2Br + (CH_3)_2CHONa$

(b) $CH_3CH_2Br + (CH_3)_2CHCH_2ONa$

(c) $PhONa + CH_3CH_2Br$

(d) $PhCH_2Br + (CH_3)_2CHONa$