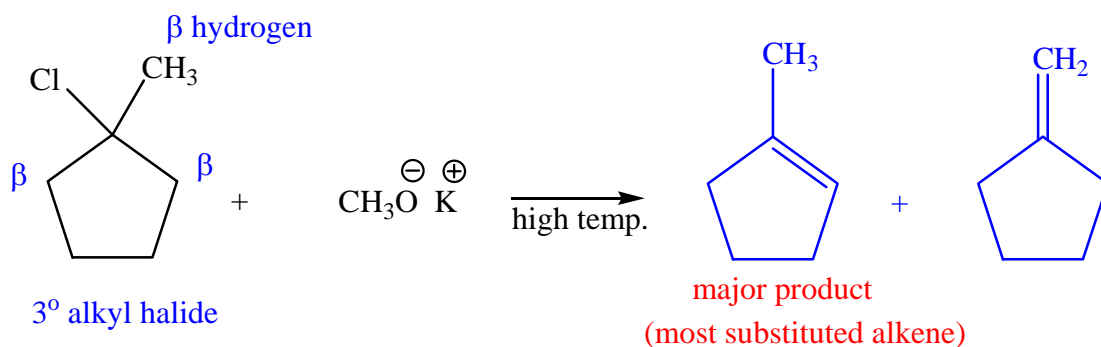


CHEM 201

Quiz # 5 Chapter 5: Alkyl Halides; Substitution and Elimination Reactions

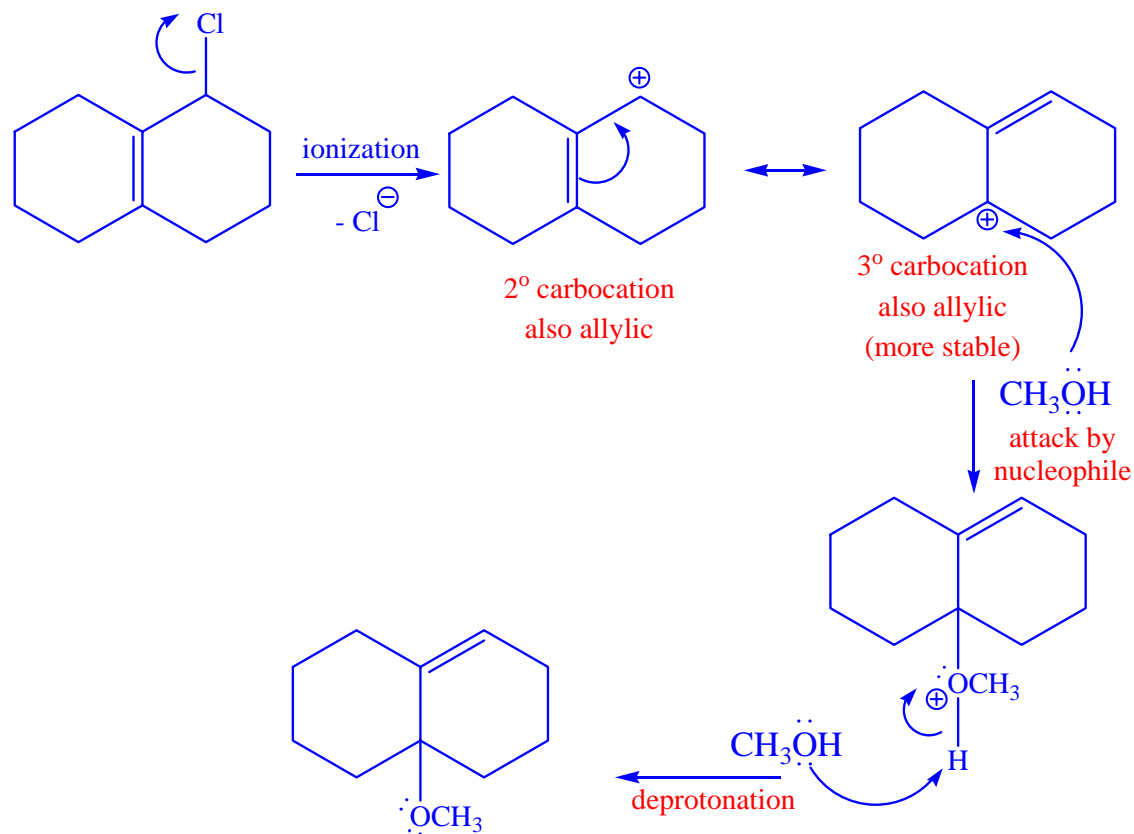
1. List all possible products from the following reaction, and indicate which product will be major.

The alkyl halide is tertiary ( $3^\circ$ ), and it is reacted with strong base at high temperature; these are conditions for  $E2$  reaction which encounters elimination of  $\beta$  hydrogen. There are two types of  $\beta$  hydrogen. The major product is more substituted one.

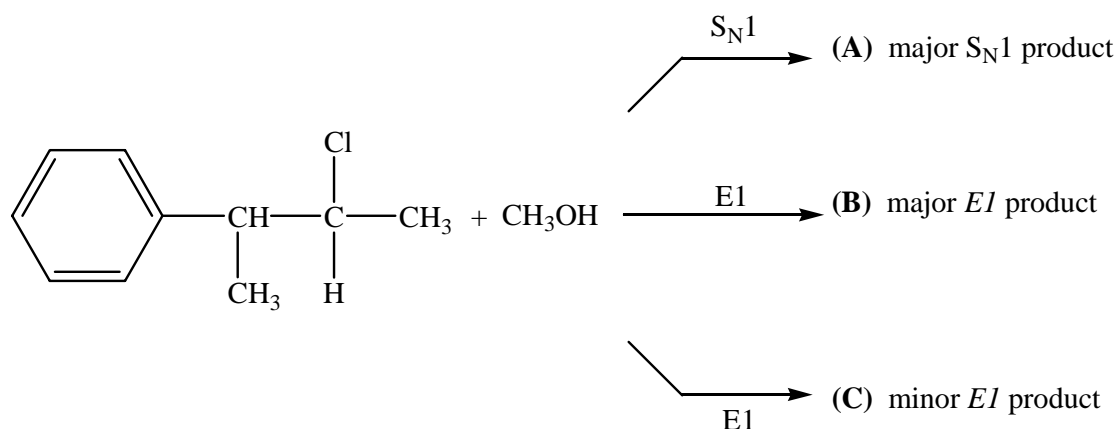


2. Show how the following solvolysis reaction leads to formation of the given product.

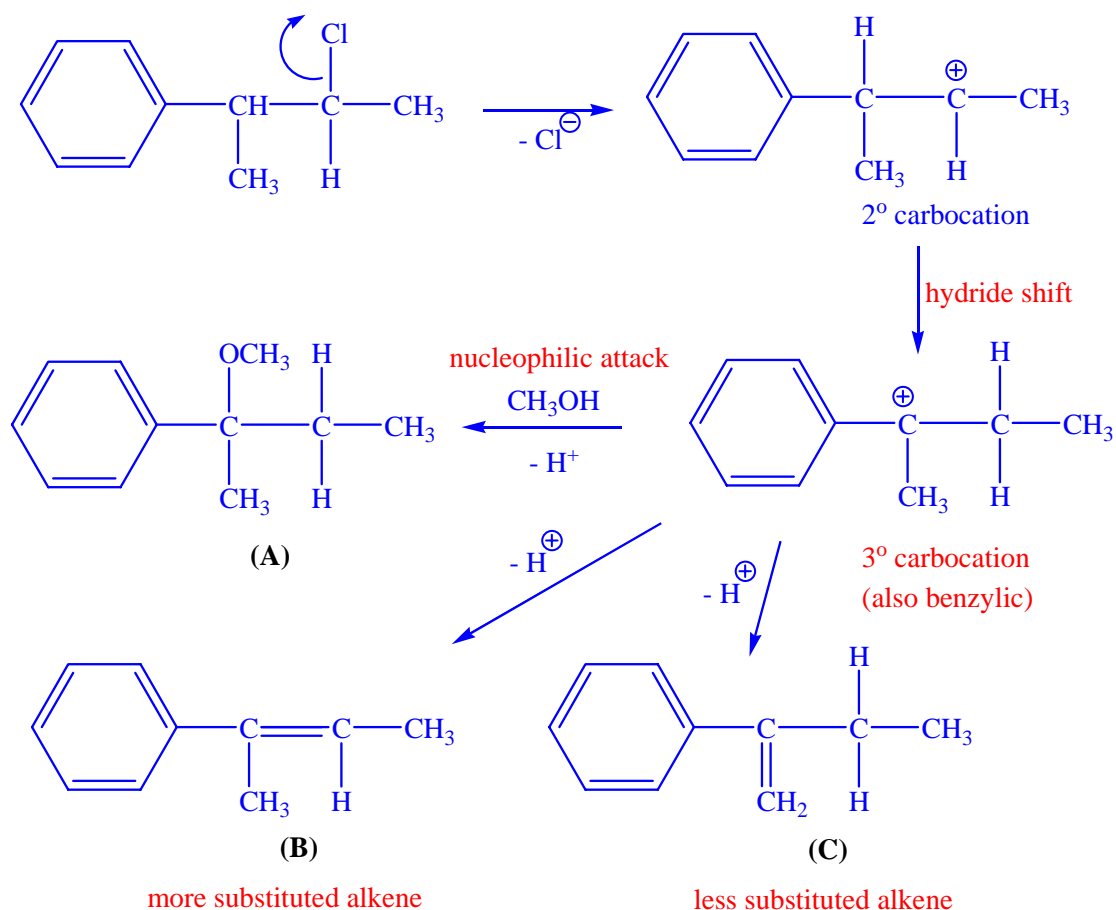
Solvolysis is  $S_N1$  reaction, which proceeds through ionization first, followed by rearrangement to a more stable carbocation whenever possible. The nucleophile (weak nucleophile) attacks the carbocation. Last step is the deprotonation (removal of proton) as shown in the following scheme.



3. Draw structures of products in the following reactions.



Both  $S_N1$  and  $E1$  proceed through ionization by means of cleavage of the C-Cl bond, then the resulting carbocation rearranges to a more stable carbocation. The reaction is completed by an attack from the nucleophile (weak nucleophile) in case of  $S_N1$  followed by deprotonation, or by an elimination of  $\beta$  hydrogen in case of  $E1$ .



the following alkene is also possible, but very minor

