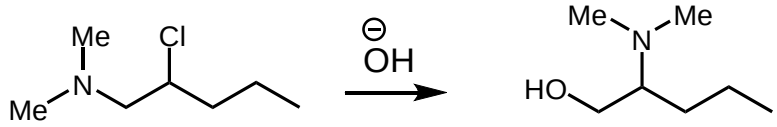
Problem 4



S. D. Ross, J. Am. Chem. Soc., 1947, 69, 2982-2983.

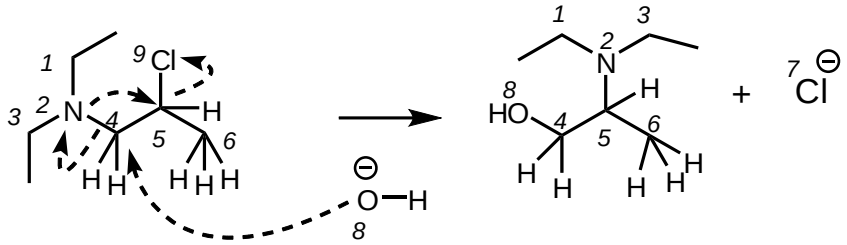
1. Draw all of the bonds near the reactive center in the starting materials

2. Draw all of the H-atoms near the reactive sites of starting materials and products

3. Balance the equation:

4. Number the non-H atoms:

5. Identify the bonds made and broken:

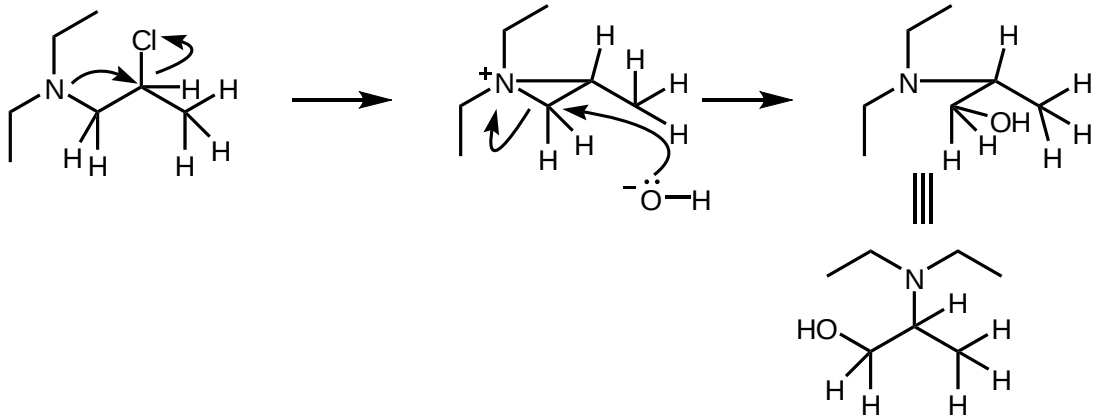


Bonds made: 2-5, 4-10

Bonds broken: 2-4, 5-6

Identify the conditions:
Basic (do not generate carbocations)

Draw the Mechanism:



Discussion:

As shown, you may find it easier to draw the middle structure and then erase the bond that is being broken to arrive at the product. The resultant structure looks different than the product. However, both are the same. If you are unsure, number the atoms on both structures. It will clearly indicate that they are the same.