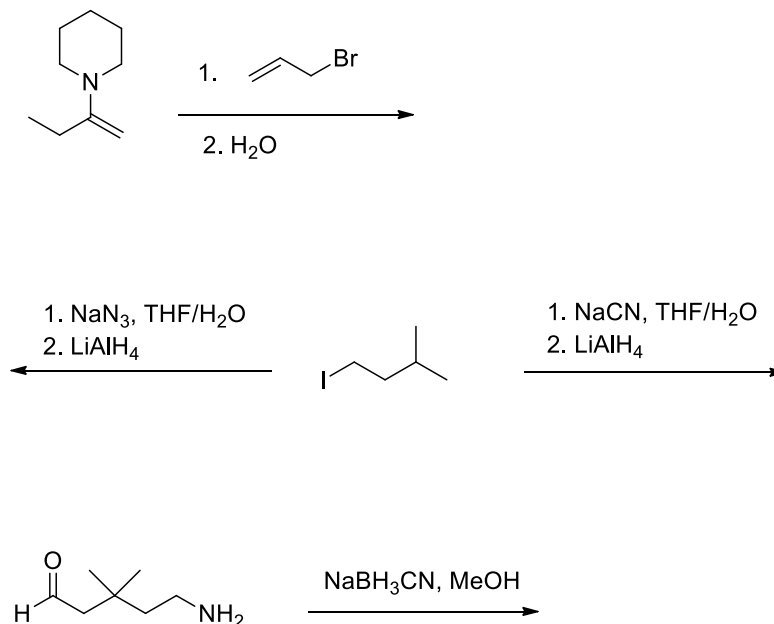


## WORKSHOP, Chapter 21

*Amines*

1. Give the product(s) for the following reactions.



2.a. Determine the structure of the following compound using the chemical and spectral evidence provided. This compound,  $\text{C}_8\text{H}_{11}\text{N}$ , gives rapid evolution of a gas when treated with aqueous nitrous acid at  $0^\circ\text{C}$ .

The  $^1\text{H}$  NMR of the starting material is  $\delta$  2.8 ppm (t, 2H),  
2.9 (t, 2H),  
5.2 (bs, 2H),  
7.1-7.3 (m, 5H).

- b. What was the gas given off?  
c. What is the complete mechanism for the following reaction?

3. Show how the following conversions could be carried out in a few steps. Provide structures for each intermediate that would be isolated and indicate reagents and conditions for each step.

