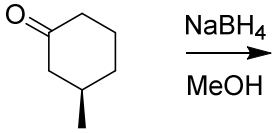
Experiment 19

Reduction of Ketones: Preparation of Benzhydrol from Benzophenone

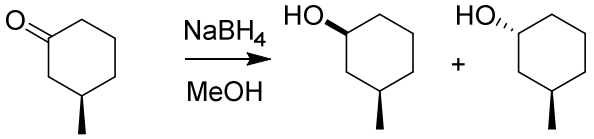
Study Questions

1) What two product alcohols would be produced if (*R*)-3-methylcyclohexanone were treated with sodium borohydride? Would you expect them to separate on a TLC plate?



(*R*)-3-methylcyclohexanone

Answer:

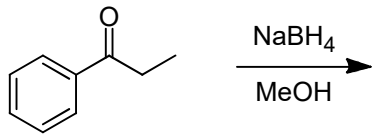


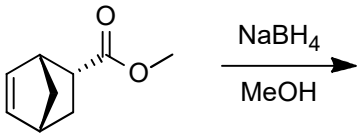
(*R*)-3-methylcyclohexanone

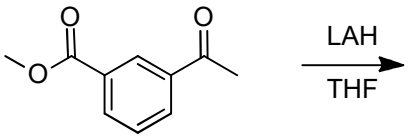
The R_f values of these compounds should be different, although they might not be different enough to permit separation.

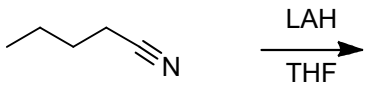
2) The solubility of a compound with a melting point of 70° is as follows: 8 g/100 mL hexanes (at 69°C); 1 g/100 mL hexanes (at 0°C). If you tried to recrystallize 1 g of this compound from 10 mL of hexanes, you would notice droplets of oil forming in the hot mixture.
   a. What is this oil? **Answer:** The oil is the compound oiling out of solution, or forming a liquid that cannot dissolve because the solution is saturated but above the melting point of the compound.
   b. What would you do to correct the problem? **Answer:** Add more solvent until there is enough to dissolve all of the molten compound.

3) For the following reaction schemes, draw the expected major product. If no reaction will take place, write *NR*. Ignore stereochemistry, and assume that an aqueous workup is included if necessary.

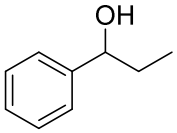
a. 

b. 

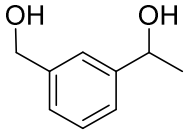
c. 

d. 

Answer:

a. 

b. NR

c. 

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