ORGANIC CHEMISTRY CHEM 12B

Grignard Reaction. Synthesis of Triphenylmethanol

Reading Experiments 33, 33A (only) in Pavia (5th edition). See also Section 13.6 in Klein See also: http://en.wikipedia.org/wiki/Grignard_reagent

General

Grignard reagents react with ketones to yield tertiary alcohols.

$$R - Br \xrightarrow{Mg}_{Et_2O} R - MgBr \xrightarrow{1. R'}_{R'} R'' \xrightarrow{OH}_{R'} R''$$

In this experiment you will generate a Grignard reagent from bromobenzene then allow it to react with a ketone, benzophenone. The procedure for Experiment 33 describes the formation of the Grignard reagent, where Experiment 33A describes the conditions for reaction of a Grignard reagent with benzophenone, which results in the formation of the tertiary alcohol.

Prelab

Include in your notebook the usual **Title**, **Name**, **Date**, **Purpose**, **Chemical Equations** (note the one above is not specific for this experiment), **Reagent Table**, an **Outline**, and a **Separation Scheme**. Note that the procedure you will follow is for Experiments 33 (formation of the Grignard) and 33A (reaction of the formed Grignard reagent with benzophenone), and although there are officially two steps for the reaction you will not isolate the Grignard reagent – both parts will be done in the same flask (so the formed reagent doesn't need to appear in the Reagent table).

Procedure

Follow the procedure for the formation of the Grignard reagent as described in Experiment 33 and the procedure for the subsequent reaction with benzophenone as described in Experiments 33A. One *modification* to the apparatus will be to add a water condenser in between the Claisen adapter and the drying tube. Purify your crude product as suggested by recrystallization from isopropyl alcohol.

To Complete the Experiment – Full Report

Weigh your dried purified product. Calculate the percent yield. Determine the melting point and obtain an IR spectrum (KBr pellet). Also obtain the ¹H NMR, ¹³C NMR spectra (GC/MS may be available, see your instructor). In your report for this experiment, you need to include a detailed analysis (i.e., assignment of peaks) of all spectral data for your product.