ALDEHYDES AND KETONES: REACTIONS WITH GRIGNARD REAGENTS

1. Grignard reagents are made by adding a halogenoalkane to small bits of magnesium in a flask containing ethoxyethane (commonly called diethyl ether or just "ether"). The flask is fitted with a reflux condenser, and the mixture is warmed over a water bath for 20 - 30 minutes.

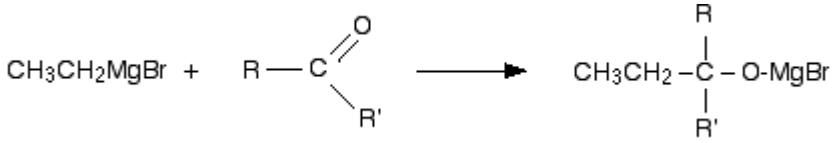
   a) Write the structure for the Grignard reagent formed if you did this starting from

   (i) 1-bromopropane,

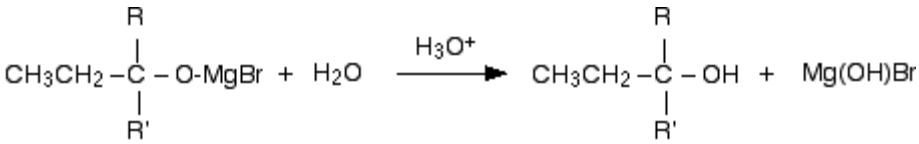
   (ii) 2-bromopropane.

   b) Explain the reason for using a reflux condenser, and the fact that the water bath mustn't be kept warm using a bunsen burner or any other naked flame.

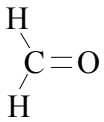
2. a) Grignard reagents are used to make alcohols of varying complexity by reactions with aldehydes and ketones. The Chemguide page gives the following general reactions starting from CH_3CH_2MgBr. R and R' are alkyl groups or hydrogen.

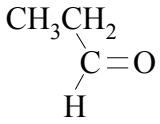


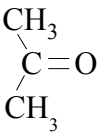
   Adding acid to this gives

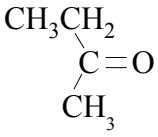


   Draw the structures of the alcohols formed if you reacted CH_3CH_2MgBr with

   (i) methanal: 

   (ii) propanal: 

   (iii) propanone: 

(iv) butanone: 

b) Using a Grignard reagent of your own choosing (not necessarily CH_3CH_2MgBr), how would you make a sample of the alcohol 2-methylpropan-2-ol?

The structure of 2-methylpropan-2-ol is