ALCOHOLS: THE REACTION WITH SODIUM

1. The reaction between alcohols and sodium is sometimes used as a test for the -OH group in the compound.

   a) Why is it important to test the pH of the liquid before adding the sodium?

   b) What would you observe if the liquid was actually an alcohol?

   c) Observing this isn't enough to be sure that you have an alcohol. What else might cause the result you described in part (b)?

   d) Suppose you added a small piece of sodium to some propan-1-ol. Write the equation for the reaction showing a fully displayed structure for the organic product.

   e) Suggest a simple lab use of this reaction of alcohols.

2. The organic product from the reaction of ethanol and sodium is sodium ethoxide, $CH_3CH_2O^-\ Na^+$.

   a) This is a white solid which produces a strongly alkaline solution in water. Explain why it forms an alkaline solution.

   b) (If you haven't already done work on halogenoalkanes (alkyl halides, haloalkanes), you could leave this question for now, unless what you have just read on this Chemguide page seems obvious to you.)

   Ethoxide ions behave very much like hydroxide ions in many of their reactions.

   (i) Write the formula for the organic product of the reaction between bromoethane and sodium hydroxide solution (assuming you get a substitution reaction).

   (ii) Write the structure for the organic product of the reaction between bromoethane and sodium ethoxide solution (assuming you get a substitution reaction).

   (iii) What *type* of compound is the product you have just drawn the structure of?