**Chemguide – questions**

**AMINES: AS BASES**

1. a) What do you understand by
   (i) a Bronsted-Lowry base;
   (ii) a Lewis base?

   b) Explain why methylamine, CH$_3$NH$_2$, acts as a base in both of these senses.

2. This question is about comparing the reactions of ammonia and methylamine as bases.
   a) Write equations to show what happens when both of these compounds dissolve in water.

   b) Explain why the compounds are acting as bases in these reactions with water.

   c) Describe what happens when ammonia gas and methylamine gas come into contact with hydrogen chloride gas.

   d) Write the formulae for the two compounds formed in these reactions, showing essential details of their structures.

   e) Describe what happens if you add a few drops of ammonia solution or methylamine solution to a solution of copper(II) sulphate containing [Cu(H$_2$O)$_6$]$^{2+}$ ions.

   f) Write equations to show what happens in these reactions.

   g) Describe what happens if you add an excess of ammonia solution or methylamine solution to a solution of copper(II) sulphate containing [Cu(H$_2$O)$_6$]$^{2+}$ ions.

   h) Write the formulae for the final copper-containing products of these reactions.

   i) In what sense are ammonia and methylamine acting as bases in these last reactions?

3. a) Write the equation for the reaction which happens when dimethylamine, (CH$_3$)$_2$NH, reacts with water.

   b) Write the formula of the product of the reaction between trimethylamine gas, (CH$_3$)$_3$N, and hydrogen chloride gas, showing the essential details of its structure.