HALOGENOALKANES: REACTIONS WITH SILVER NITRATE SOLUTION

1. a) You get a substitution reaction in which the halogen atom is displaced as a halide ion which can be tested for using silver nitrate solution.

   b) Everything present will dissolve in this mixture, and so you get a better reaction. (The halogenoalkane is virtually insoluble in pure water, and the sodium hydroxide is insoluble in pure ethanol.)

   c) This removes any excess hydroxide ions. Hydroxide ions react with silver nitrate solution to produce a confusing precipitate.

   d)

	Colour of precipitate	**Effect of adding dilute ammonia solution to the precipitate**	**Effect of adding concentrated ammonia solution to the precipitate**
2-chloropropane	White	Precipitate dissolves to give a colourless solution	Precipitate dissolves to give a colourless solution
2-bromopropane	Very pale cream	Not much noticeable effect	Precipitate dissolves to give a colourless solution
2-iodopropane	Very pale yellow	No effect	No effect

   e) $Ag^+_{(aq)} + Br^-_{(aq)} \longrightarrow AgBr_{(s)}$

   (Care! The precipitate was formed by a coming together of sliver and bromide ions *after* the bromide ions were displaced from the 2-bromopropane. The 2-bromopropane isn't directly involved in this reaction.)

2. a) 2-iodopropane would react most quickly followed by 2-bromopropane and then 2-chloropropane.

   b) The halogen atom has to break away from the carbon it is attached to. The weakest carbon-halogen bond is C-I followed by C-Br and C-Cl is the strongest.

   c) The precipitate from the tertiary halide will be first followed by the secondary and then the primary.