

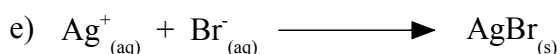
Chemguide – answers

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



(Care! The precipitate was formed by a coming together of silver 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.