

## Chemguide – questions

### HALOGENOALKANES: REACTIONS WITH SILVER NITRATE SOLUTION

1. You can test which halogen is present in a halogenoalkane in the following way:

The halogenoalkane is warmed with a solution of sodium hydroxide in a mixture of ethanol and water. The mixture is then acidified with dilute nitric acid, and silver nitrate solution added to produce a precipitate. To confirm what the precipitate is, you can test it with ammonia solution.

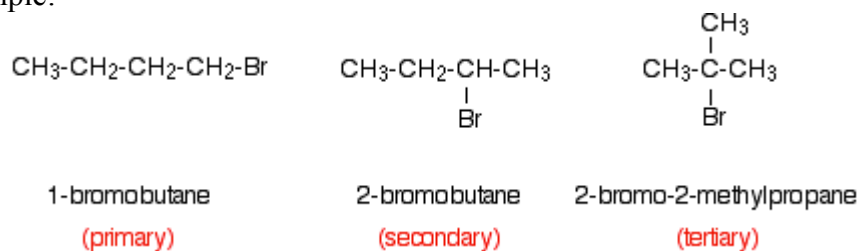
- Why is the halogenoalkane treated with sodium hydroxide solution?
- Why is a mixture of ethanol and water used as the solvent?
- Why is the mixture acidified with dilute nitric acid?
- Complete the following table to show the results for three different halogenoalkanes.

	<b>Colour of precipitate</b>	<b>Effect of adding dilute ammonia solution to the precipitate</b>	<b>Effect of adding concentrated ammonia solution to the precipitate</b>
<b>2-chloropropane</b>			
<b>2-bromopropane</b>			
<b>2-iodopropane</b>			

- Write the ionic equation for the formation of the precipitate in the 2-bromopropane case.
2. You can compare the reactivities of the various halogenoalkanes by testing them by adding a solution of silver nitrate in a mixture of ethanol and water, and waiting until a precipitate appears. It takes different lengths of time depending on which halogenoalkane you have.
- If you tested the halogenoalkanes in the table above in this way, list the halogenoalkanes in the order in which the precipitate appears (quickest first).
  - Explain why the precipitates appear in this order.

## Chemguide – questions

c) Suppose you repeated this test, keeping the halogen the same in each case, but changing the nature of the halogenoalkane from primary to secondary to tertiary. The Chemguide page quotes these as an example:



What order will the precipitates appear in this time?