GROUP 7: TESTING FOR HALIDE IONS

1. You can test for the presence of the halide ions chloride, bromide and iodide by adding dilute nitric acid to a solution of the suspected halide followed by silver nitrate solution, and looking for a precipitate.

   a) Why can't you test for fluoride ions by this method?

   b) What is the point of adding the dilute nitric acid?

   c) Name the precipitate if you had iodide ions present.

   d) Write the ionic equation for the reaction involving iodide ions.

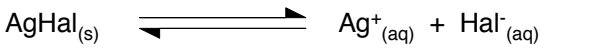
   e) Complete the following table to show the results of doing this:

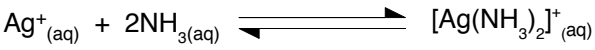
ion	observation
Cl^-	
Br^-	
I^-	

   f) Two of the precipitates are easy to confuse, and to distinguish between them, you can add ammonia solution, both dilute and concentrated. Complete the following table to show the results of adding the two different concentrations of ammonia solution to the precipitates.

precipitate from	effect of adding dilute ammonia solution	effect of adding concentrated ammonia solution
chloride ions		
bromide ions		
iodide ions		

2. There are two equilibria involved in the reactions in question 1(f):





   In the first equation, equilibrium can only occur if you have some solid silver halide present – in other words, you have to have enough silver and halide ions present to form a saturated solution in the presence of some solid.

   Use these equilibria to explain the results of adding ammonia solution to the silver halide precipitates.