



HALIDE ION TESTS

Action	Reason
1) Add nitric acid (aq) to the solution being tested.	This removes any other ions that could give a precipitate with silver nitrate (aq), e.g. carbonate ions: $\text{CO}_3^{2-} + 2 \text{H}^+ \rightarrow \text{CO}_2 + \text{H}_2\text{O}$
2) Add silver nitrate (aq) to the solution being tested.	This produces a precipitate for Cl^- , Br^- and I^- ions.
3) Add ammonia (aq) (dilute & conc) to the precipitate.	This is used to see if the precipitates re-dissolve to help confirm their identity.

PART 1 – Trying out the tests

Complete the table to give (a) observations and (b) equations for any reactions that take place (use ionic equations).

	Addition of $\text{AgNO}_3(\text{aq})$	Addition of dilute $\text{NH}_3(\text{aq})$	Addition of concentrated $\text{NH}_3(\text{aq})$
$\text{F}^-(\text{aq})$	no reaction		
$\text{Cl}^-(\text{aq})$	white precipitate $\text{Ag}^+(\text{aq}) + \text{Cl}^-(\text{aq}) \rightarrow \text{AgCl}(\text{s})$	colourless solution $\text{AgCl}(\text{s}) + 2\text{NH}_3(\text{aq}) \rightarrow \text{Ag}(\text{NH}_3)_2^+(\text{aq}) + \text{Cl}^-(\text{aq})$	
$\text{Br}^-(\text{aq})$	cream precipitate $\text{Ag}^+(\text{aq}) + \text{Br}^-(\text{aq}) \rightarrow \text{AgBr}(\text{s})$	no reaction (precipitate remains)	colourless solution $\text{AgBr}(\text{s}) + 2\text{NH}_3(\text{aq}) \rightarrow \text{Ag}(\text{NH}_3)_2^+(\text{aq}) + \text{Br}^-(\text{aq})$
$\text{I}^-(\text{aq})$	yellow precipitate $\text{Ag}^+(\text{aq}) + \text{I}^-(\text{aq}) \rightarrow \text{AgI}(\text{s})$	no reaction (precipitate remains)	no reaction (precipitate remains)

PART 2 – Testing for halide ions

Sample	U	V	W	X
Addition of $\text{AgNO}_3(\text{aq})$				
Addition of dilute NH_3				
Addition of conc NH_3				
Halide ion contained (✓ or ✗)				
Identity of halide ion				