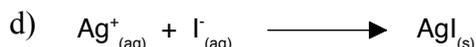


Chemguide – answers

GROUP 7: TESTING FOR HALIDE IONS

- a) Silver fluoride is soluble in water, and so you wouldn't get a precipitate.
b) The acid reacts removes any other ions present which might cause a confusing precipitate.
c) Silver iodide.



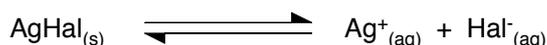
e)

ion	observation
Cl^-	White precipitate
Br^-	Pale cream precipitate
I^-	Pale yellow precipitate

f)

precipitate from	effect of adding dilute ammonia solution	effect of adding concentrated ammonia solution
chloride ions	Precipitate dissolves to give a colourless solution	Precipitate dissolves to give a colourless solution
bromide ions	Little effect – precipitate is almost unchanged	Precipitate dissolves to give a colourless solution
iodide ions	Precipitate doesn't dissolve	Precipitate doesn't dissolve

- The equilibrium involving the ammonia lies well to the right, and therefore the concentration of free silver ions in solution is greatly lowered. The equilibrium



will move to the right in order to replace them (Le Chatelier's Principle). Silver chloride is the most soluble of the three halides, and in this case, the equilibrium shift is enough that the solution is no longer saturated, and so the precipitate dissolves.

Silver bromide is less soluble than silver chloride, and using dilute ammonia doesn't remove enough free silver ions to stop the solution being saturated. But concentrated ammonia shifts the equilibrium



further to the right (Le Chatelier's Principle), and reduces the free silver ion concentration enough that the silver bromide solution is no longer saturated, and so the precipitate dissolves. Silver iodide is so insoluble that no amount of ammonia will lower the concentration of free silver ions enough for the precipitate to dissolve.

I have tried to produce this answer without talking about solubility products. If your syllabus expects you to know about solubility products, it is slightly easier to explain using them – see the Chemguide page.