

# Testing for halides

Answer all the questions below then check your answers

1. Why are silver nitrate reagent bottles usually dark brown in colour?
2. Complete the following equations:
  - i.  $\text{AgNO}_3(\text{aq}) + \text{NaCl}(\text{aq})$
  - ii.  $\text{AgNO}_3(\text{aq}) + \text{NaBr}(\text{aq})$
  - iii.  $\text{AgNO}_3(\text{aq}) + \text{NaI}(\text{aq})$
3. What is a precipitation reaction?
4. Complete the table below to show the colours of the precipitates from question 2 and also to show their solubility in ammonia solution.

Halide ion	Colour of precipitate with silver nitrate solution	Solubility in dilute ammonia	Solubility in concentrated ammonia
$\text{F}^-$			
$\text{Cl}^-$			
$\text{Br}^-$			
$\text{I}^-$			

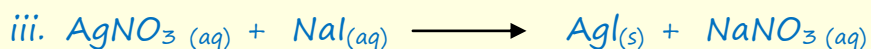
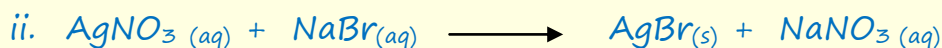
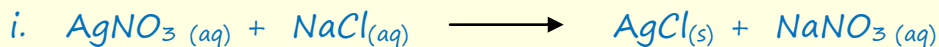
5. A lead (II) nitrate solution was added to a solution of potassium iodide. A yellow precipitate of lead iodide was formed.
- Write a symbolic equation for this reaction.
  - lead halides are all insoluble solids. Lead fluoride and lead chlorides are colourless white solids, while the bromide and iodide salts are yellow.
    - A sodium halide solution was mixed with silver nitrate solution, but no precipitate formed. However when the sodium halide was added to lead nitrate a white precipitate formed. Write an equation to show the formation of this white precipitate.
    - A magnesium halide solution formed a cream coloured precipitate when an acidified silver nitrate solution was added; it also gave a yellow precipitate when added to lead nitrate solution. Write an equation to show the formation of this precipitate with lead (II) nitrate solution.
6. After student had mixed acidified silver nitrate solution and sodium chloride solution the white precipitate began to turn a dark grey colour. Explain why the precipitate changed colour.

## Answers

1. Why are silver nitrate reagent bottles usually dark brown in colour?

Silver nitrate is a light sensitive chemical, it will decompose in sunlight to form metallic silver.

2. Complete the following equations:



3. What is a precipitation reaction?

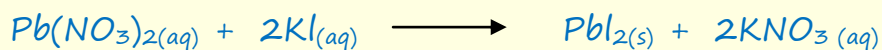
When 2 solutions mix to produce an insoluble solid (a precipitate).

4. Complete the table below to show the colours of the precipitates from question 2 and also to show their solubility in ammonia solution.

Halide ion	Colour of precipitate with silver nitrate solution	Solubility in dilute ammonia	Solubility in concentrated ammonia
$\text{F}^-$	No precipitate		
$\text{Cl}^-$	white	soluble	soluble
$\text{Br}^-$	Cream	insoluble	soluble
$\text{I}^-$	yellow	insoluble	insoluble

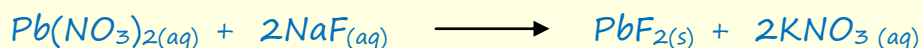
5. A lead (II) nitrate solution was added to a solution of potassium iodide. A yellow precipitate of lead iodide was formed.

i. Write a symbolic equation for this reaction.

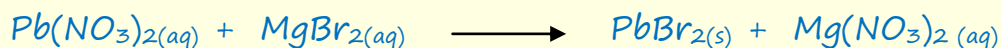


b. lead halides are all insoluble solids. Lead fluoride and lead chlorides are colourless white solids, while the bromide and iodide salts are yellow.

i. A sodium halide solution was mixed with silver nitrate solution, but no precipitate formed. However when the sodium halide was added to lead nitrate a white precipitate formed. Write an equation to show the formation of this white precipitate.



ii. A magnesium halide solution formed a cream coloured precipitate when an acidified silver nitrate solution was added; it also gave a yellow precipitate when added to lead nitrate solution. Write an equation to show the formation of this precipitate with lead (II) nitrate solution.



6. After student had mixed acidified silver nitrate solution and sodium chloride solution the white precipitate began to turn a dark grey colour. Explain why the precipitate changed colour. *Silver chloride is a light sensitive chemical and decomposes in sunlight to form metallic silver.*