

Answer all the questions below then check your answers

1. What is a precipitation reaction?

2. Fill in the Gap to complete the sentence:

a. The colour of the precipitate formed when silver nitrate reacts with chloride ions is _____.

3. Which of the following is not a halide ion?

- a). Chloride b). Bromide
- c). Nitrate d). Iodide



4. Write the ionic equation for the reaction between an aqueous silver nitrate solution and a sodium chloride solution.

5. Which of the following statements is true about the solubility of silver halides?

a) Silver chloride is soluble in water.

b) Silver bromide is soluble in concentrated ammonia but not in dilute ammonia.

c) Silver iodide is soluble in both dilute and concentrated ammonia.

d) All silver halides are insoluble in water.

6. Describe the colour of the precipitates formed when silver nitrate reacts with chloride, bromide, and iodide ions.

7. Fill in the Gap to complete the sentence below:

The silver halide precipitates can be distinguished by their different ______ when treated with ammonia solution.

8. Explain why the silver nitrate solution must be acidified with dilute nitric acid before testing for halide ions.

9. Which sequence correctly describes the solubility of silver halides in dilute and concentrated ammonia?

a) AgCl is soluble in dilute ammonia, AgBr is insoluble in dilute ammonia, AgI is soluble in concentrated ammonia.

b) AgCl is soluble in dilute ammonia, AgBr is soluble in concentrated ammonia, AgI is insoluble in both.

c) AgCl is insoluble in dilute ammonia, AgBr is soluble in dilute ammonia, AgI is insoluble in concentrated ammonia.

d) AgCl is soluble in both dilute and concentrated ammonia, AgBr and AgI are soluble only in dilute ammonia.

10. How are the different coloured precipitates formed by the reaction of silver nitrate with halide ions used to test for the presence of specific halide ions in a solution? Include details on any further tests needed to confirm the identity of each halide ion.

<u>Answers</u>

1. What is a precipitation reaction?

Answer: A precipitation reaction is a chemical reaction where two soluble salts in aqueous solutions are combined, resulting in the formation of an insoluble salt (precipitate) that settles out of the solution.

2. Fill in the Gap to complete the sentence:

a. The colour of the precipitate formed when silver nitrate reacts with chloride ions is

Answer: white

- 3. Which of the following is not a halide ion?
- a). Chloride b). Bromide c). Nitrate d). Iodide

Answer: c) Nitrate

4. Write the ionic equation for the reaction between an aqueous silver nitrate solution and a sodium chloride solution.

Answer: $Ag^+_{(aq)} + Cl^-_{(aq)} \rightarrow AgCl_{(s)}$

- 5. Which of the following statements is true about the solubility of silver halides?
- a) Silver chloride is soluble in water.
- b) Silver bromide is soluble in concentrated ammonia but not in dilute ammonia.
- c) Silver iodide is soluble in both dilute and concentrated ammonia.
- D) All silver halides are insoluble in water.

Answer: b) Silver bromide is soluble in concentrated ammonia but not in dilute ammonia.

6. Describe the colour of the precipitates formed when silver nitrate reacts with chloride, bromide, and iodide ions.

Answer:

Silver chloride (AgCl) forms a white precipitate.

Silver bromide (AgBr) forms a cream precipitate.

Silver iodide (AgI) forms a yellow precipitate.

7. Fill in the Gap to complete the sentence below:

The silver halide precipitates can be distinguished by their different ______ when treated with ammonia solution.

Answer: solubility

8. Explain why the silver nitrate solution must be acidified with dilute nitric acid before testing for halide ions.

Answer: The silver nitrate solution is acidified with dilute nitric acid to remove any carbonate or hydroxide impurities that could also form precipitates with silver ions. Acidification prevents the formation of silver carbonate or silver hydroxide, which could lead to false-positive results when testing for halide ions.

9. Which sequence correctly describes the solubility of silver halides in dilute and concentrated ammonia?

a) AgCl is soluble in dilute ammonia, AgBr is insoluble in dilute ammonia, AgI is soluble in concentrated ammonia.

b) AgCl is soluble in dilute ammonia, AgBr is soluble in concentrated ammonia, AgI is insoluble in both.

c) AgCl is insoluble in dilute ammonia, AgBr is soluble in dilute ammonia, AgI is insoluble in concentrated ammonia.

d) AgCl is soluble in both dilute and concentrated ammonia, AgBr and AgI are soluble only in dilute ammonia.

Answer: b) AgCl is soluble in dilute ammonia, AgBr is soluble in concentrated ammonia, AgI is insoluble in both.

10. How are the different coloured precipitates formed by the reaction of silver nitrate with halide ions used to test for the presence of specific halide ions in a solution? Include details on any further tests needed to confirm the identity of each halide ion.

Answer: The different coloured precipitates formed when silver nitrate reacts with halide ions allow for the identification of specific halides:

Chloride ions react with silver nitrate to form a white precipitate of silver chloride (AgCl). This precipitate is soluble in dilute ammonia, confirming the presence of chloride ions.

Bromide ions react with silver nitrate to form a cream precipitate of silver bromide (AgBr). This precipitate is insoluble in dilute ammonia but soluble in concentrated ammonia, which confirms the presence of bromide ions.

Iodide ions react with silver nitrate to form a yellow precipitate of silver iodide (AgI). This precipitate is insoluble in both dilute and concentrated ammonia, confirming the presence of iodide ions.