

**S3 Chemistry Quiz**  
**Test for Anions**

Test	Test for	Reagent	Result
1	(a)	Dilute hydrochloric acid	Colourless gas bubbles
2	Cl <sup>-</sup> (aq)	(b) solution	White precipitate
3	SO <sub>4</sub> <sup>2-</sup> (aq)	Acidified barium chloride solution	(c)

Name the "Colourless gas bubbles" in Test 1. (d)

Name the "White precipitate" in Test 2. (e)

If the cation in test 1 is ammonium ion, write a balanced chemical equation. (f)

If magnesium chloride is used in test 2, write a balanced chemical equation. (g)

If aluminium sulphate is used in test 3, write a balanced chemical equation. (h)

**S3 Chemistry Quiz**  
**Test for Anions**  
**Suggested Answers and Additional Information**

Test	Test for	Reagent	Result
1	(a) $\text{CO}_3^{2-}(\text{aq})$	Dilute hydrochloric acid	Colourless gas bubbles
2	$\text{Cl}^-(\text{aq})$	(b) Acidified silver nitrate solution	White precipitate
3	$\text{SO}_4^{2-}(\text{aq})$	Acidified barium chloride solution	(c) White precipitate

Name the "Colourless gas bubbles" in Test 1.

(d) Carbon dioxide

Name the "White precipitate" in Test 2.

(e) Silver chloride

If the cation in test 1 is ammonium ion, write a balanced chemical equation.

(f)  $(\text{NH}_4)_2\text{CO}_3(\text{aq}) + 2\text{HCl}(\text{aq}) \longrightarrow 2\text{NH}_4\text{Cl}(\text{aq}) + \text{CO}_2(\text{g}) + \text{H}_2\text{O}(\text{l})$

If magnesium chloride is used in test 2, write a balanced chemical equation.

(g)  $\text{MgCl}_2(\text{aq}) + 2\text{AgNO}_3(\text{aq}) \longrightarrow 2\text{AgCl}(\text{s}) + \text{Mg}(\text{NO}_3)_2(\text{aq})$

If aluminium sulphate is used in test 3, write a balanced chemical equation.

(h)  $\text{Al}_2(\text{SO}_4)_3(\text{aq}) + 3\text{BaCl}_2(\text{aq}) \longrightarrow 3\text{BaSO}_4(\text{s}) + 2\text{AlCl}_3(\text{aq})$

**Addition Information**

Test for	Reagent	Result
$\text{CO}_3^{2-}(\text{aq})$	Dilute hydrochloric acid / Dilute nitric acid	Colourless gas bubbles Carbon dioxide
$\text{Cl}^-(\text{aq})$	Acidified silver nitrate solution (Dilute nitric acid)	White precipitate Silver chloride
$\text{SO}_4^{2-}(\text{aq})$	Acidified barium chloride solution (Dilute hydrochloric acid) / Acidified barium nitrate solution (Dilute nitric acid)	White precipitate Barium sulphate

White precipitate = solid which is insoluble in water

**Word Equations:**

1. Metal carbonate + hydrochloric acid  $\longrightarrow$  Metal chloride + carbon dioxide + water

2. Metal chloride + silver nitrate  $\longrightarrow$  Metal nitrate + silver chloride  
 (AgCl = insoluble in water)

3. Metal sulphate + barium chloride  $\longrightarrow$  Metal chloride + barium sulphate  
 (BaSO<sub>4</sub> = insoluble in water)