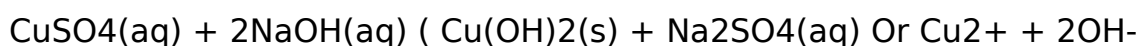


Test for cations and anions essay sample



**ASSIGN
BUSTER**

CATION TEST OBSERVATION Copper Cu²⁺ Add dilute sodium hydroxide solution e. g. in CuCl₂ solution or solid. Blue precipitate of copper hydroxide, which does not dissolve in excess NaOH. Blue in solution or as a solid.

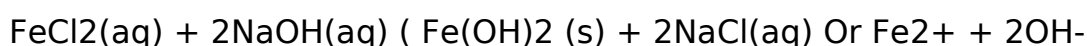


(Cu(OH)₂(s) **Iron (II) Fe²⁺** Add dilute sodium hydroxide solution e. g. in

FeCl₂ solution or as a solid. Often pale green A dark green gelatinous

precipitate is formed that does not dissolve in excess NaOH. in colour. It

turns brown on standing as it is oxidised in air to Fe(III) hydroxide, Fe(OH)₃.



(Fe(OH)₂(s) **Iron (III) Fe³⁺** Add dilute sodium hydroxide solution e. g. in FeCl₃

solution or solid; often yellow in A dark rusty brown gelatinous precipitate is

formed that does not dissolve in excess NaOH solution and red/brown in

solid. FeCl₃(aq) + 3NaOH(aq) (Fe(OH)₃ (s) + 3NaCl(aq) Or Fe³⁺ + 3OH⁻

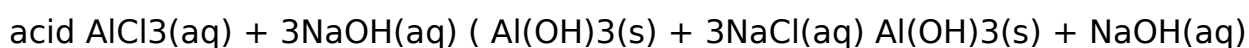


Aluminium Al³⁺ Add dilute sodium hydroxide solution These are colourless in

solids and in solution A white precipitate forms, BUT it dissolves in excess

sodium hydroxide solution, because NaAl(OH)₄(aq) is soluble. Aluminium

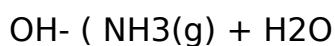
hydroxide is said to be amphoteric because it dissolves in an alkali and an



(NaAl(OH)₄(aq) **Ammonium NH₄⁺** Add dilute sodium hydroxide solution

NH₄Cl and warm, test gas with pH paper A smelly alkaline gas that turns pH

paper blue is given off. Ammonia is released from the ammonium salt.



Tests for Cations and Anions with Equations

ANION TEST OBSERVATION Carbonate CO₃²⁻- Add dilute nitric acid e. g. in Na₂CO₃ in solution or as a solid Solid or the solution evolves a colourless gas which turns lime water milky – a white precipitate Na₂CO₃(s) + 2HNO₃ (2NaNO₃ + CO₂ + H₂O Ca(OH)₂(aq) + CO₂ (CaCO₃(s) + H₂O Sulphate ion SO₄²⁻- Add dilute hydrochloric acid to the Substance must be in solution solution, followed by barium chlorideA white precipitate of barium sulphate forms e. g. Na₂SO₄(aq) solution BaCl₂(aq) + Na₂SO₄(aq) (BaSO₄(s) + 2NaCl(aq) Ionically Ba²⁺(aq) + SO₄²⁻(aq) (BaSO₄(s) Halide ions Add dilute nitric acid to the Chloride ion Cl⁻ - solution, then add silver nitrate Silver chloride is white, silver bromide is cream, silver iodide is yellow. Bromide ion Br⁻ - solution; observe the colour. Add You can distinguish between a chloride, bromide and iodide using aqueous ammonia solution: Iodide ion I⁻ - ammonia solution and judge the AgCl is soluble in ammonia solution e. g. from KCl(aq), NaBr(aq), LiI(aq) solubility of the solid in it. AgBr is partially soluble AgI is insoluble in NH₃(aq) AgNO₃(aq) + KCl(aq) (AgCl(s) + KNO₃(aq) Ionically for an iodide (I⁻) Ag⁺(aq) + I⁻ (AgI(s)