

CHEMISTRY ALTERNATIVE-TO-PRACTICAL FOR SCHOOL CERTIFICATE

Test for anions (negative ions)

ANION	TEST	TEST RESULTS
carbonate (CO_3^{2-})	add dilute acid	effervescence, carbon dioxide produced
chloride (Cl^-) [in solution]	acidify with dilute nitric acid, then add aqueous silver nitrate	white ppt.
iodide (I^-) [in solution]	acidify with dilute nitric acid, then add aqueous silver nitrate	yellow ppt.
nitrate (NO_3^-) [in solution]	add aqueous sodium hydroxide, then aluminium foil; warm carefully	ammonia produced
sulfate (SO_4^{2-}) [in solution]	acidify with dilute nitric acid, then add aqueous barium nitrate	white ppt., insoluble in excess dilute nitric acid
sulfite (SO_3^{2-}) [in solution]	warm with dilute acid	sulfur dioxide produced

Test for cations (positive ions)

CATION	EFFECT OF AQUEOUS SODIUM HYDROXIDE	EFFECT OF AQUEOUS AMMONIA
aluminium (Al^{3+})	white ppt., soluble in excess giving a colourless solution	white ppt., insoluble in excess
ammonium (NH_4^+)	ammonia produced on warming	—
calcium (Ca^{2+})	white ppt., insoluble in excess	no ppt. or a very slight white ppt.
copper (Cu^{2+})	light blue ppt., insoluble in excess	light blue ppt., soluble in excess, giving a dark blue solution
chromium (III) (Cr^{3+})	green ppt., soluble in excess, giving a green solution	green ppt., insoluble in excess
iron (II) (Fe^{2+})	green ppt., insoluble in excess	green ppt., insoluble in excess
iron (III) (Fe^{3+})	red-brown ppt., insoluble in excess	red-brown ppt., insoluble in excess
zinc (Zn^{2+})	white ppt., soluble in excess, giving a colourless solution	white ppt., soluble in excess, giving a colourless solution

Identification of gases

GAS	TEST AND TEST RESULT
ammonia (NH ₃)	turns damp red litmus paper blue
carbon dioxide (CO ₂)	turns limewater milky
chlorine (Cl ₂)	bleaches damp litmus paper
hydrogen (H ₂)	'pops' with a lighted splint
oxygen (O ₂)	relights a glowing splint
sulfur dioxide (SO ₂)	turns aqueous acidified potassium manganate(VII) from purple to colourless

Chemical test for water

1. It turns anhydrous copper (II) sulfate from white to blue.
2. It turns cobalt (II) chloride paper from blue to pink.