

Chapter 11: Quantitative Analysis

No.

Date

sodium hydroxide

ammonia

Cation:	Effect of NaOH		Effect of aqueous NH ₃	
	a few drops	in excess	a few drops	in excess
Zinc (Zn ²⁺)	white ppt.	soluble	white ppt.	soluble
Aluminium (Al ³⁺)	white ppt.	soluble	white ppt.	insoluble
Lead (II) (Pb ²⁺)	white ppt.	soluble	white ppt.	insoluble
Calcium (Ca ²⁺)	white ppt.	insoluble	no ppt.	-
Copper (II) (Cu ²⁺)	light blue ppt.	insoluble	light blue ppt.	soluble
Iron (II) (Fe ²⁺)	green ppt.	insoluble	green ppt.	insoluble
Iron (III) (Fe ³⁺)	red-brown ppt.	insoluble	red-brown ppt.	insoluble
Ammonium (NH ₄ ⁺)	Ammonia gas when warmed		-	-

Both insoluble

Anion	test	observation
carbonate (CO ₃ ²⁻)	add acid	carbon dioxide produced
Chloride (Cl ⁻)	1. add dilute nitric acid	white ppt.
Iodide (I ⁻)	2. add aqueous silver nitrate	yellow ppt.
Nitrate (NO ₃ ⁻)	1. add aqueous sodium hydroxide and warm 2. add aluminium foil & warm carefully	ammonia produced
Sulfate (SO ₄ ²⁻)	1. add dilute nitric acid 2. add aqueous barium nitrate	white ppt.

	gas	test	observation
odourless	Carbon dioxide (CO ₂)	bubble gas into limewater	forms white ppt.
	Hydrogen (H ₂)	place lighted splint	flame extinguishes with 'pop'
	Oxygen (O ₂)	place glowing splint	glowing splint is rekindled
pungent	Ammonia (NH ₃)	place moist red litmus paper	turns blue
	Chlorine (Cl ₂)	place moist blue litmus paper	turns red then bleaches
	Sulfur dioxide (SO ₂)	add acidified potassium manganate (VII), KMnO ₄	turns from purple to colourless