

Compounds of certain metals impart a characteristic colour to a flame. The procedure to detect the colour imparted is as follows.

A thin platinum wire is first thoroughly cleaned by dipping it in concentrated hydrochloric acid. It is then heated in non-luminous flame of burner. The process is repeated. When the wire imparts no colour to the flame, it is ready for use.

Now the wire is first dipped in concentrated HCl and then into a small amount of substance being investigated. It is then introduced into the non-luminous part of flame and the colour imparted to the flame is observed.

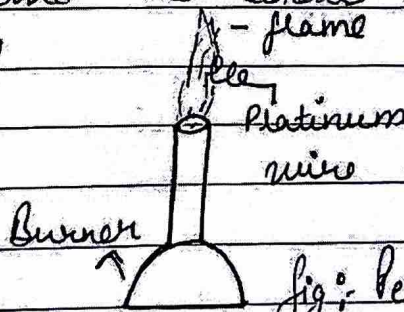


Fig: Performing flame test

Recognition of substances by colour, odour, physical state and action of heat

Colour:	Suspected ion
(i) Blue or bluish green colour	Cu^{2+}
(ii) Light green colour	Fe^{2+}
(iii) Yellow or Yellowish brown	Fe^{3+}
(iv) White colour (or colourless)	$\text{Pb}^{2+}, \text{Zn}^{2+}, \text{Ca}^{2+}, \text{Na}^+, \text{K}^+ \text{ or } \text{NH}_4^+$

B. Odour :

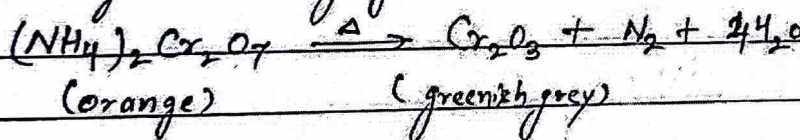
- (1) Smell of ammonia gas NH_4^+
- (2) Smell of hydrogen sulphide gas S^{2-}
- (3) Smell of sulphur dioxide gas SO_3^{2-}

C. State :

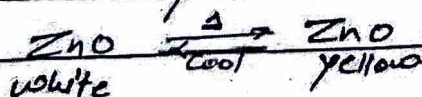
- (1) Amorphous Salt Carbonates CO_3^{2-}
- (2) Hygroscopic or deliquescent nature Chlorides Cl^- or Nitrates NO_3^-

D. Action of Heat :

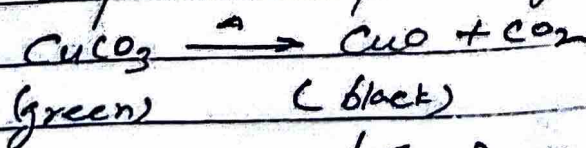
- (1) Ammonia salt when heated with alkali produces ammonia gas. Ammonia nitrate and ammonia chloride leave no residue behind on heating ammonia dichromate on heating leaves greenish grey mass



- (2) PbO_2 , Pb_3O_4 , HgO , KNO_3 , NaNO_3 on heating produce oxygen gas
- (3) Carbonate and bicarbonate on heating evolve CO_2
- (4) Hydrated salt on heating produce water vapour
- (5) Sulphites and some sulphates when heated produce SO_2
- (6) Lead compounds decomposes to give lead monoxide PbO
 PbO is brown when hot, yellow when cold.
- (7) Zinc oxide is yellow when hot, white when cold



- (8) Copper compounds decompose to give black copper oxide CuO



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