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EXPERIMENT NO. 12

NAME OF EXPERIMENT: TO IDENTIFY ACIDIC AND BASIC RADICAL FROM THE GIVEN SAMPLE OF SALT

APPARATUS REQUIRED

1. Test tube
2. Test tube holder

CHEMICALS REQUIRED

1. Dil. HCl
2. Conc. H_2SO_4
3. $FeSO_4$
4. Cu turning
5. $AgNO_3$
6. $AgNO_3$
7. Dil. HNO_3

THEORY

The electropositive radical which comes from base is called basic radical. In other words, the radical of bases other than OH^- ion is called basic radical. For example: Na^+

The electronegative radical which comes from an acid is called acidic radical. In other words, the radical of the acid other than H^+ ion is called acid radical. For example: Cl^-, Br^-, I^-, etc.

OBSERVATION (For Acidic radical)

Dry test

Experiment	Observation	Inference
1. A pinch of salt was taken in clean and dry test tube and dil. HCl was added.	1. No gas was evolved.	1. Absence of CO_3^{--}, SO_3^{--}.
2. A pinch of salt was taken in clean and dry test tube and conc. H_2SO_4 was added.	2. No gas was evolved.	2. Absence of halogen.
3. Cu turning was added in exp. (2).	3. No brown fume was evolved.	3. Absence of NO_3^-

Wet test

Experiment	Observation	Inference
1. Salt solution was taken in test tube and $BaCl_2$ was added (If ppt was appeared, excess dil. HCl was added.).	1. White ppt was formed which was insoluble in excess dil. HCl.	1. Presence of SO_4^{--}.
2. Salt solution was taken in test tube and conc. H_2SO_4 was added and $FeSO_4$ was added.	2. No brown ring was formed.	2. Absence of NO_3^-

3. Salt solution was taken in test tube and dil. HNO_3 was added and boiled then cooled and $AgNO_3$ was added.	3. No ppt was formed.	3. Absence of Cl^-

REACTION INVOLVED

$$Na_2SO_4 + BaCl_2 \longrightarrow BaSO_4\downarrow + 2NaCl$$

white ppt

$$BaSO_4 + HCl \longrightarrow \text{No reaction}$$

OBSERVATION (For basic radical)

Experiment	Observation	Inference
A pinch of salt was taken in clean and dry test tube then heated (moisture condenses on the upper part of test tube.)	Salt having water of crystallization.	May be presence of Zn.

Filter Ash Test

When charcoal reduction test is not performed, then this test can be done. This test is also based on the fact that on heating cobalt nitrate is converted to cobalt oxide. Salt solution was taken and few drop of cobalt nitrate solution was added. The solution was shaked.

Piece of filter paper was dipped in the solution and the paper was ignited completely.

Experiment	Observation	Inference
Filter ash test was performed.	Colour of ash was green.	Presence of Zn^{2+} salt.

REACTION INVOLVED

$2\,Co(NO_3)_2 \xrightarrow{\Delta} 2CoO + 4NO_2 + O_2$

$MgCO_3 \xrightarrow{\Delta} MgO + CO_2$

i) $ZnO + CoO \xrightarrow{\Delta} CoO\,ZnO$ (Cobalt zincate)
green

Wet test

Experiment	Observation	Inference
1. 1 ml of salt solution was taken in test tube and dil. HCl was added.	1. No ppt was seen.	1. Absence of group I.
2. Exp. (1) was warmed and H_2S gas was passed for 20 seconds.	2. No white ppt was seen.	2. Absence of group II.
3. 1 ml of salt solution was taken in test tube and NH_4OH and NH_4Cl was added.	3. No white ppt was seen.	3. Absence of group IIIA
4. Above exp (3) was warmed and H_2S gas was passed.	4. White ppt was seen.	4. Presence of group IIIB

Confirm Test

Experiment	Observation	Inference
1 ml of salt solution was taken and NaOH was added.	White ppt was seen.	Presence of Zn salt.

REACTION INVOLVED

$Zn^{++} + 2NaOH \longrightarrow Zn(OH)_2 \downarrow + 2Na^{+}$

white ppt

$Zn(OH)_2 + 2NaOH \longrightarrow Na_2ZnO_2 + H_2O$

sodium zincate soluble

RESULT

Hence, acidic and basic radical in the given sample salt was detected i.e. SO_4^{--} and Zn^{++}.

PRECAUTION

1. Apparatus must be handled properly.
2. The process of drying should be done properly.
3. Conc. acid must be handled carefully.

11/12/15