**SYSTEMATIC ANALYSIS OF GIVEN SIMPLE SALT**

<table>
<thead>
<tr>
<th>S</th>
<th>Experiment</th>
<th>Observation</th>
<th>Inference</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Colour of the salt</td>
<td>blue, green, pale green, colourless</td>
<td>May be copper salt, may be copper salt, may be ferrous salt, absence of copper and ferrous salts</td>
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<td>2</td>
<td>Appearance of the Salt</td>
<td>Crystalline, powdery</td>
<td>May be sulphate, nitrate, chloride, may be carbonate or sulphide</td>
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<td>3</td>
<td>Solubility in water</td>
<td>Soluble, insoluble</td>
<td>May be nitrate, sulphate, chloride, may be carbonate or sulphide</td>
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<td>4</td>
<td>Action of heat: little of the salt is heated in a dry test tube</td>
<td>i) blue, turning lime water milky. ii) reddish brown gas, iii) pungent smelling gas giving dense white fumes with glass rod dipped in conc. HCl. iv) no characteristic change</td>
<td>May be carbonate, may be nitrate, may be ammonium, absence of carbonate, nitrate, ammonium.</td>
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<td>5</td>
<td>Flame test : little of the salt is made into a paste with conc. HCl in a watch glass and it is burnt by the non luminous part of the Bunsen flame using a glass rod</td>
<td>i) brick red flame, ii) bluish green flame, iii) no characteristic flame</td>
<td>Presence of calcium, presence of copper, absence of calcium and copper</td>
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<td>6</td>
<td>Ash test: little of the salt is taken in a watch glass and mixed with conc. HCl and cobalt nitrate solution. Dipped in a filter paper and burnt.</td>
<td>No characteristic coloured ash</td>
<td>Absence of aluminium, zinc and magnesium</td>
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<td>7</td>
<td>Action of dil. HCl: Salt + dil. HCl</td>
<td>i) colourless, odourless gas with brisk effervescence turning lime water milky. ii) no brisk effervescence</td>
<td>Presence of carbonate is confirmed, absence of carbonate</td>
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<td>8</td>
<td>Copper turning test: Salt + copper turnings + conc. H₂SO₄ and heated</td>
<td>reddish brown gas, no reddish brown gas</td>
<td>Presence of nitrate, absence of nitrate</td>
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<td>9</td>
<td>Action of NaOH: Salt + NaOH and heated</td>
<td>pungent smelling gas with the smell of ammonia gives dense white fumes with rod dipped in conc. HCl. No pungent smelling gas</td>
<td>Presence of ammonium, absence of ammonium</td>
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<tr>
<td>10</td>
<td>Chromyl chloride test: Salt + K₂Cr₂O₇ + conc. H₂SO₄ and heated.</td>
<td>red orange vapours evolved, no red orange vapours evolved</td>
<td>Presence of chloride confirmed, absence of chloride</td>
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**Preparation of Sodium Carbonate extract:**
Salt + Na₂CO₃ + distilled water, boiled, cooled and filtered. The clear filtrate is called sodium carbonate extract.

| 11 | AgNO₃ test: Extract + dil. HNO₃ + AgNO₃ | Curdy white precipitate, no curdy white precipitate | Presence of chloride, absence of chloride |
### Analysis Of Basic Radicals

#### Preparation of Original Solution:
Salt + water (dil. HCl) gives original solution

#### Analysis Of Ammonium:
Salt Solution + NaOH + Nessler’s reagent
- Reddish brown precipitate: Presence of ammonium (zero group)
- No reddish brown precipitate: Absence of ammonium

#### Group Separation
1. Original Solution + dil. HCl
   - No White precipitate: Absence of I group lead
2. Original Solution + dil. HCl + H₂S gas is passed
   - Black precipitate: Presence of copper
   - No Black precipitate: Absence of II group copper
3. Original Solution + NH₄Cl + NH₄OH
   - Grass green precipitate soluble in dil HCl is obtained: Presence of III group ferrous iron.
   - No Grass green precipitate: Absence of III group ferrous iron.
4. Original Solution + NH₄Cl + NH₄OH + H₂S gas is passed
   - No dirty white precipitate: Absence of IV group Zinc
5. Original Solution + NH₄Cl + NH₄OH + (NH₄)CO₃
   - White precipitate: Presence of V group Calcium
   - No White precipitate: Absence of V group Calcium
6. Original solution + NH₄Cl + NH₄OH + disodium hydrogen phosphate
   - No White precipitate: Absence of VI group magnesium

#### Confirmatory Test For Basic Radicals
1. Copper (Group II)
   - Original solution + NH₄OH
     - Blue precipitate: Copper is confirmed
2. Copper (Group II)
   - Original solution + Potassium ferrocyanide
     - Chocolate Brown precipitate: Copper is confirmed
3. Ferrous (Group III)
   - Original solution + Potassium ferricyanide
     - Blue precipitate: Ferrous is confirmed
4. Calcium (Group V)
   - Original solution + NH₄OH + ammonium oxalate
     - White precipitate: Calcium is confirmed
5. Ammonium (Zero group)
   - Salt + NaOH + Nessler’s reagent
     - Reddish brown precipitate: Ammonium is confirmed

**Result:** The given simple salt contains

1. Acid radical_________________
2. Basic radical _________________
3. The given simple salt -----------------------