

10th-11th WEEKs

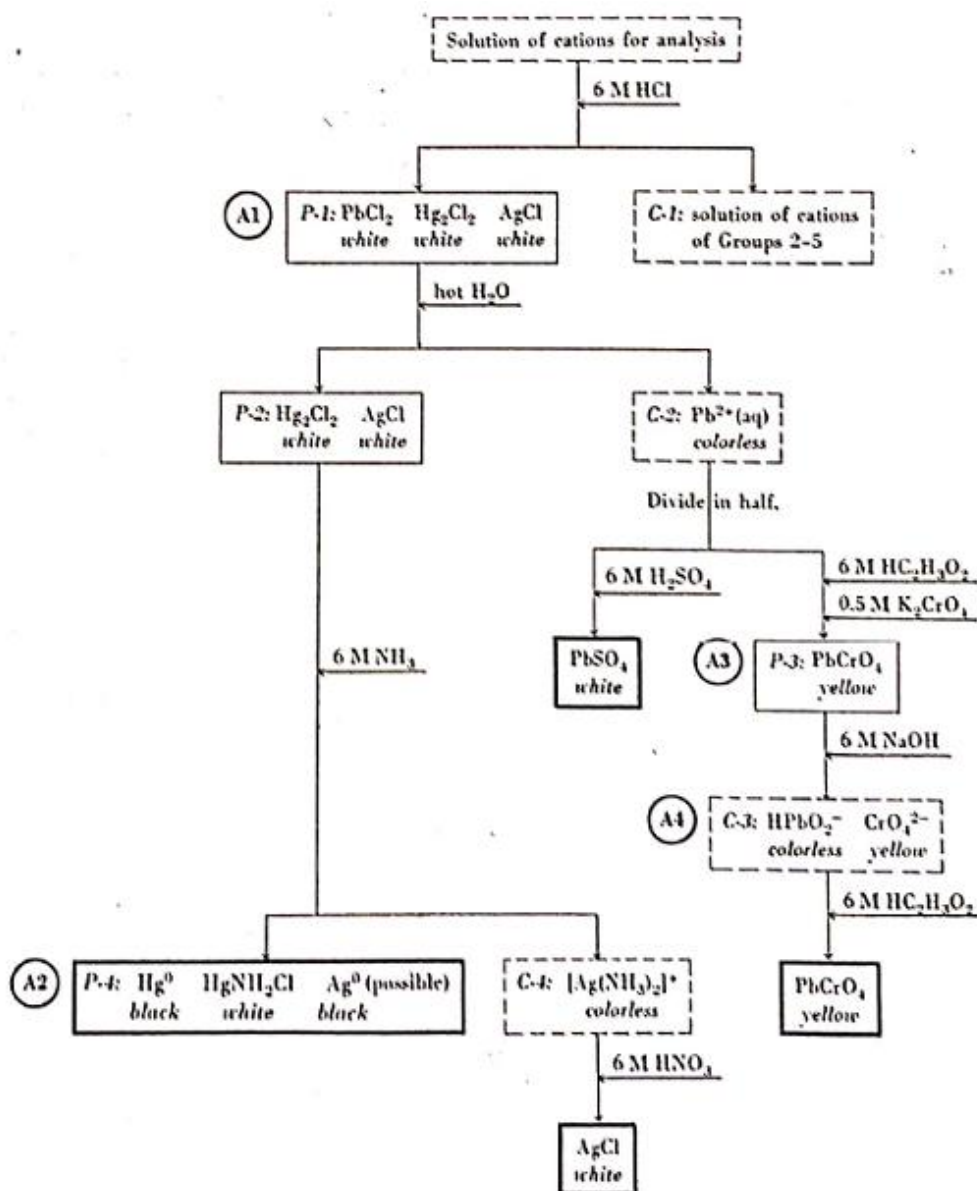
Analysis of Cation Groups 1-5 Mixture Sample:

- Each student complete the procedures for their own UNKNOWN Cation Groups 1-5 mixture sample analysis.

In all analysis schemes, precipitates are enclosed in boxes with solid lines, solutions are contained in boxes with dashed lines.

Cation Group 1: The Chloride Group- Pb^{2+} - Hg_2^{2+} - Ag^+

The cations lead(II), mercury (I) and silver (I) form sparingly soluble compounds with chloride ion.

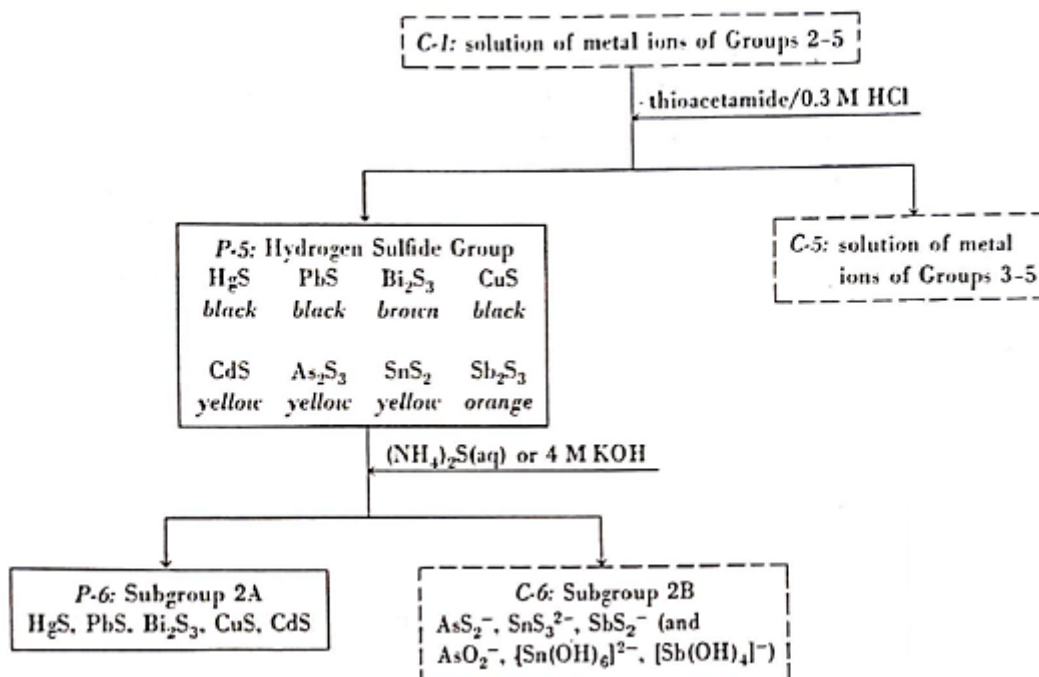


Qualitative analysis flowchart for The Chloride Group

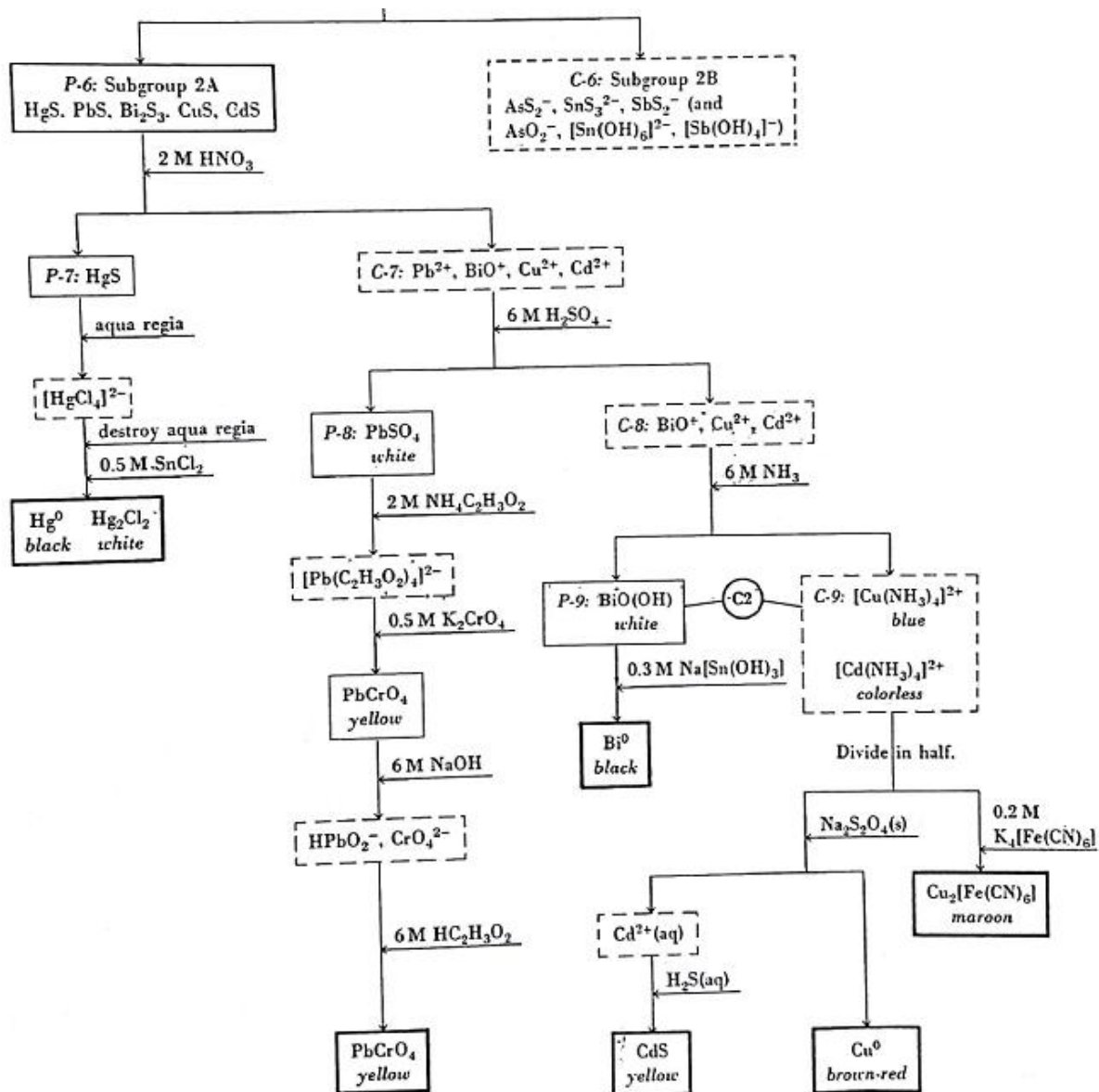
Cation Group 2: The Hydrogen Sulfide Group-



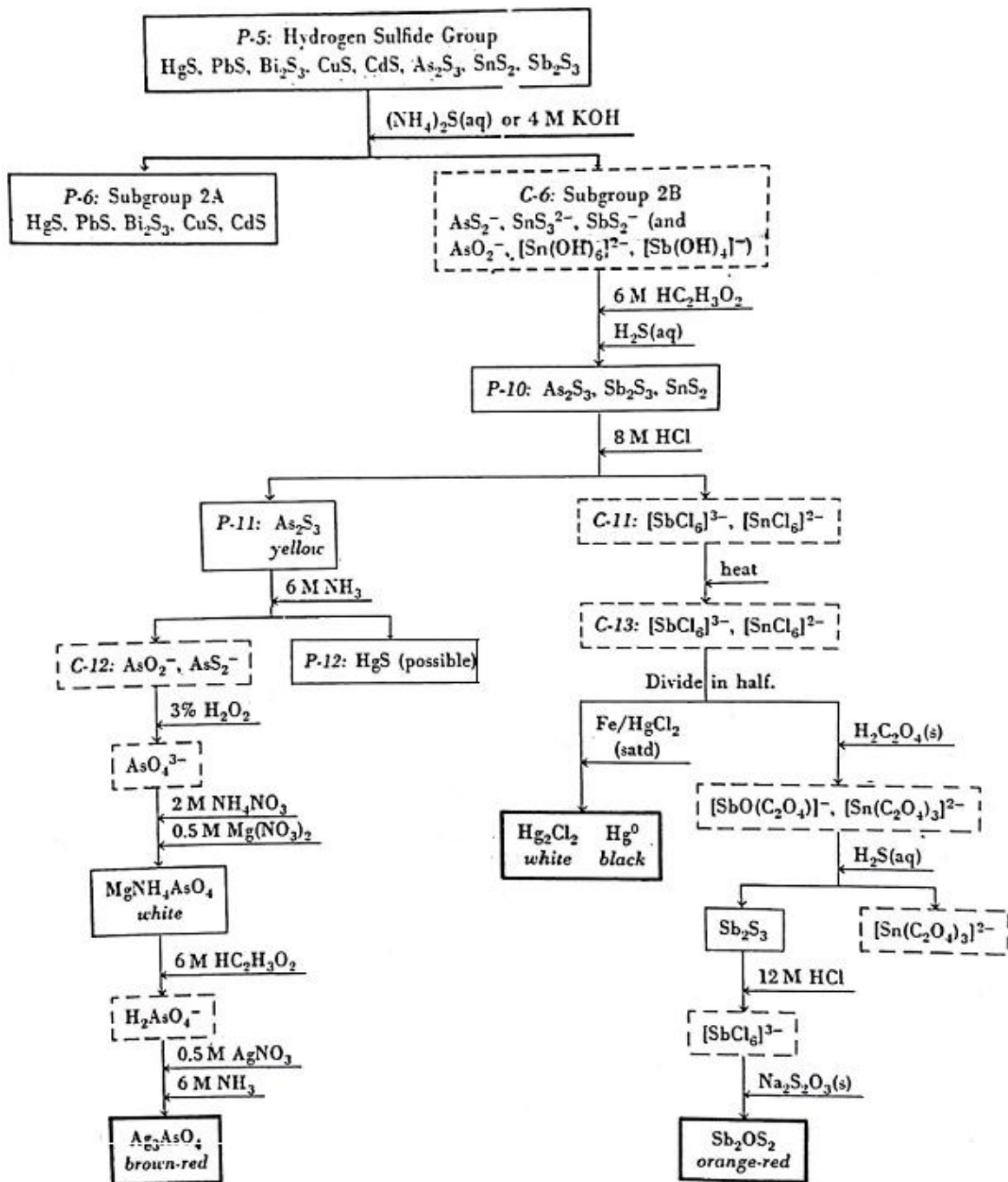
The cations of the hydrogen sulfide group form very sparingly soluble sulfides that are precipitated when a moderately acidic solution is saturated with hydrogen sulfide.



Qualitative analysis flowchart for The Hydrogen Sulfide Group: Precipitation and separation into two subgroups

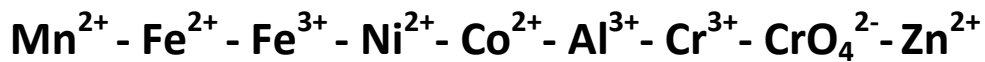


Qualitative analysis flowchart for The Hydrogen Sulfide Subgroup 2A

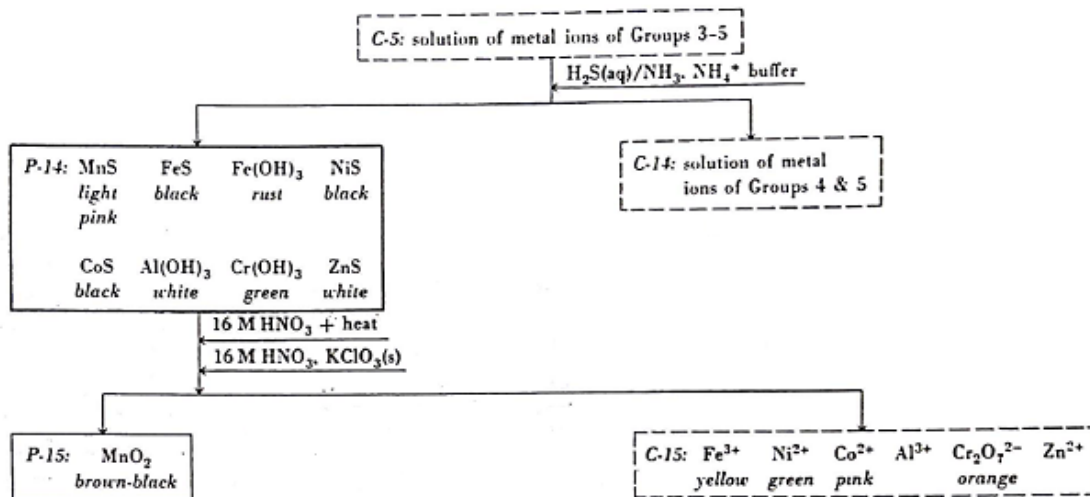


Qualitative analysis flowchart for The Hydrogen Sulfide Subgroup 2B

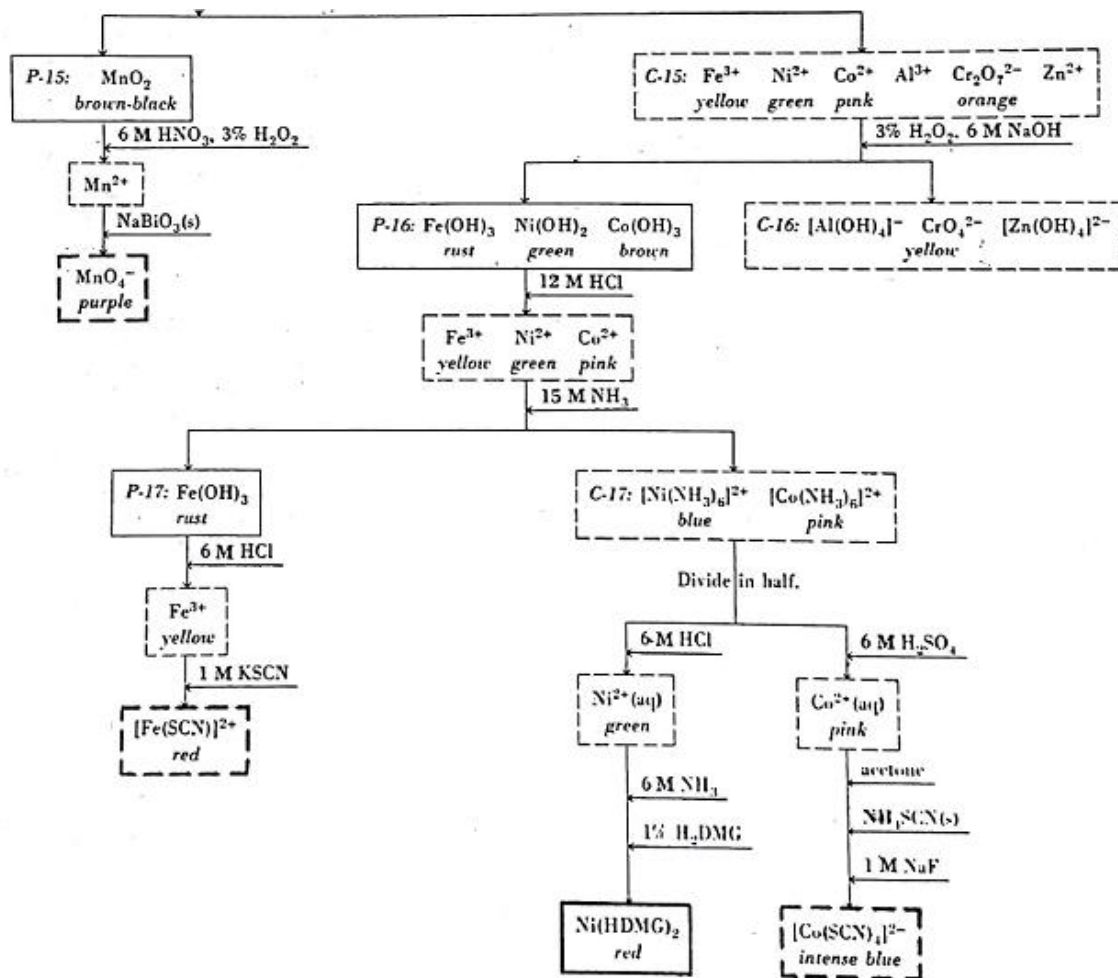
Cation Group 3: The Ammonium Sulfide Group-



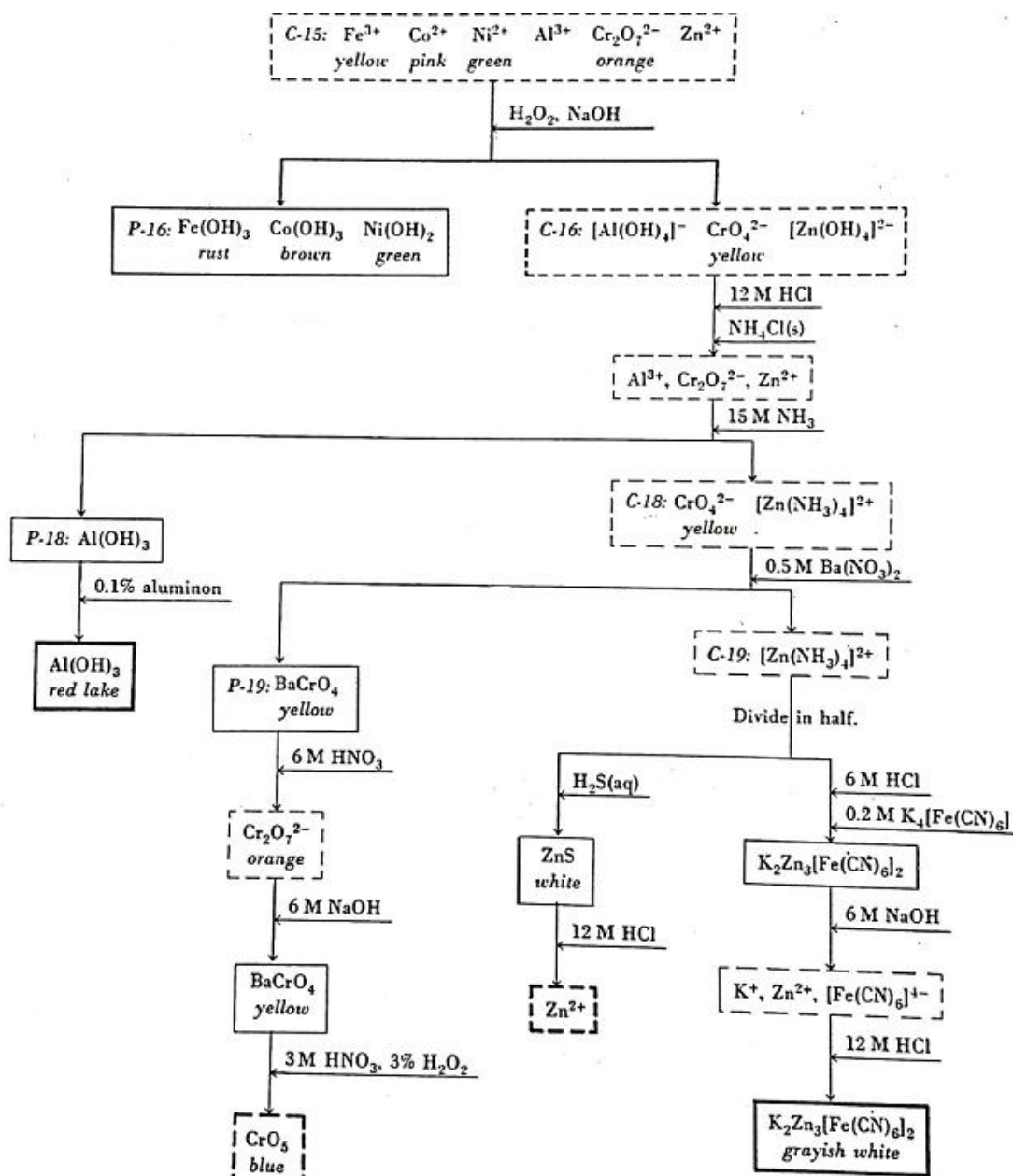
The cations of the ammonium sulfide group are precipitated as hydroxides and sulfides from an alkaline solution of hydrogen sulfide.



Qualitative analysis flowchart for The Ammonium Sulfide Group: Precipitation and separation into two subgroups



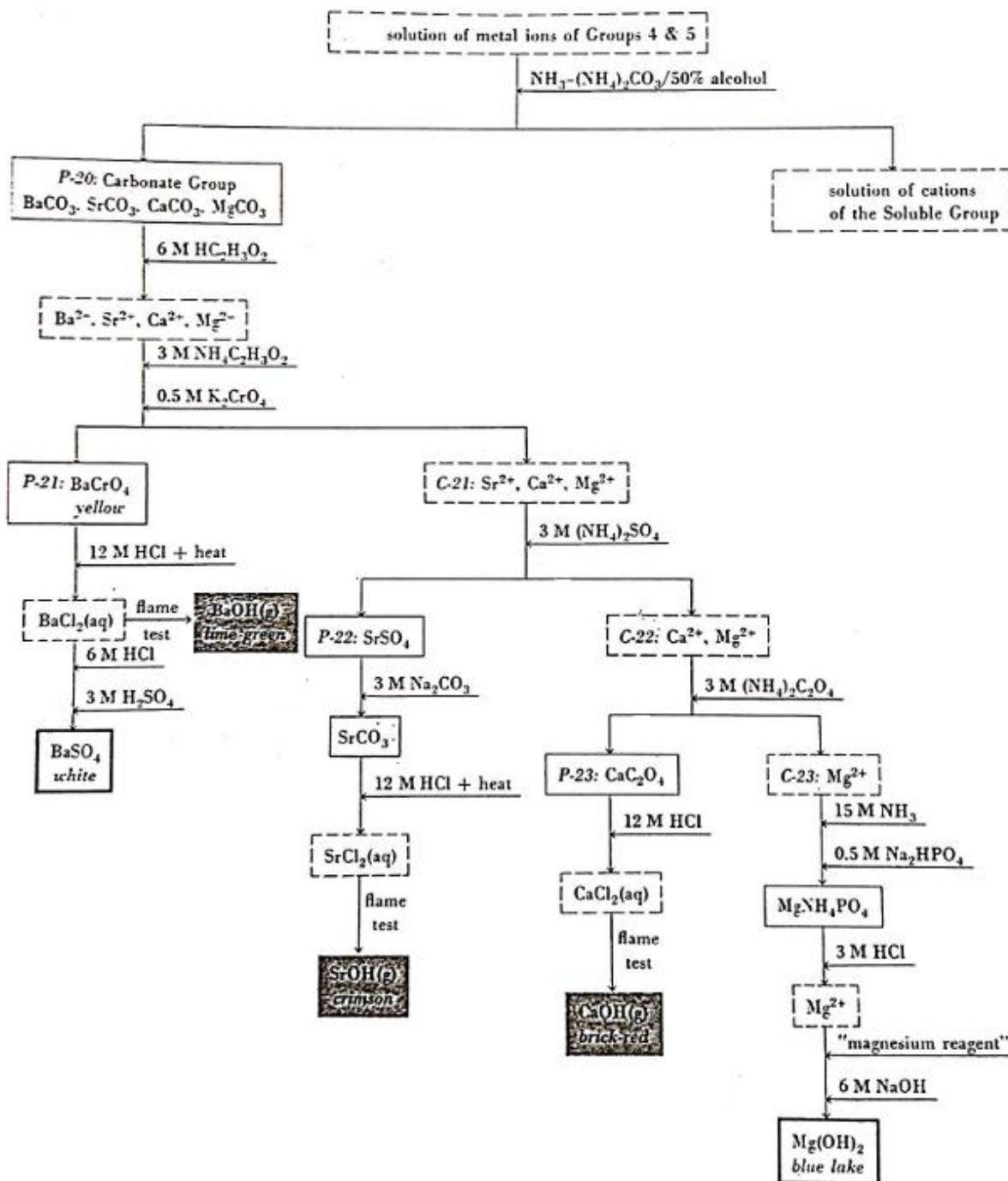
Qualitative analysis flowchart for The Ammonium Sulfide Subgroup 3A



Qualitative analysis flowchart for The Ammonium Sulfide Subgroup 3B

Cation Group 4: The Carbonate Group- Ba^{2+} - Sr^{2+} - Ca^{2+} - Mg^{2+}

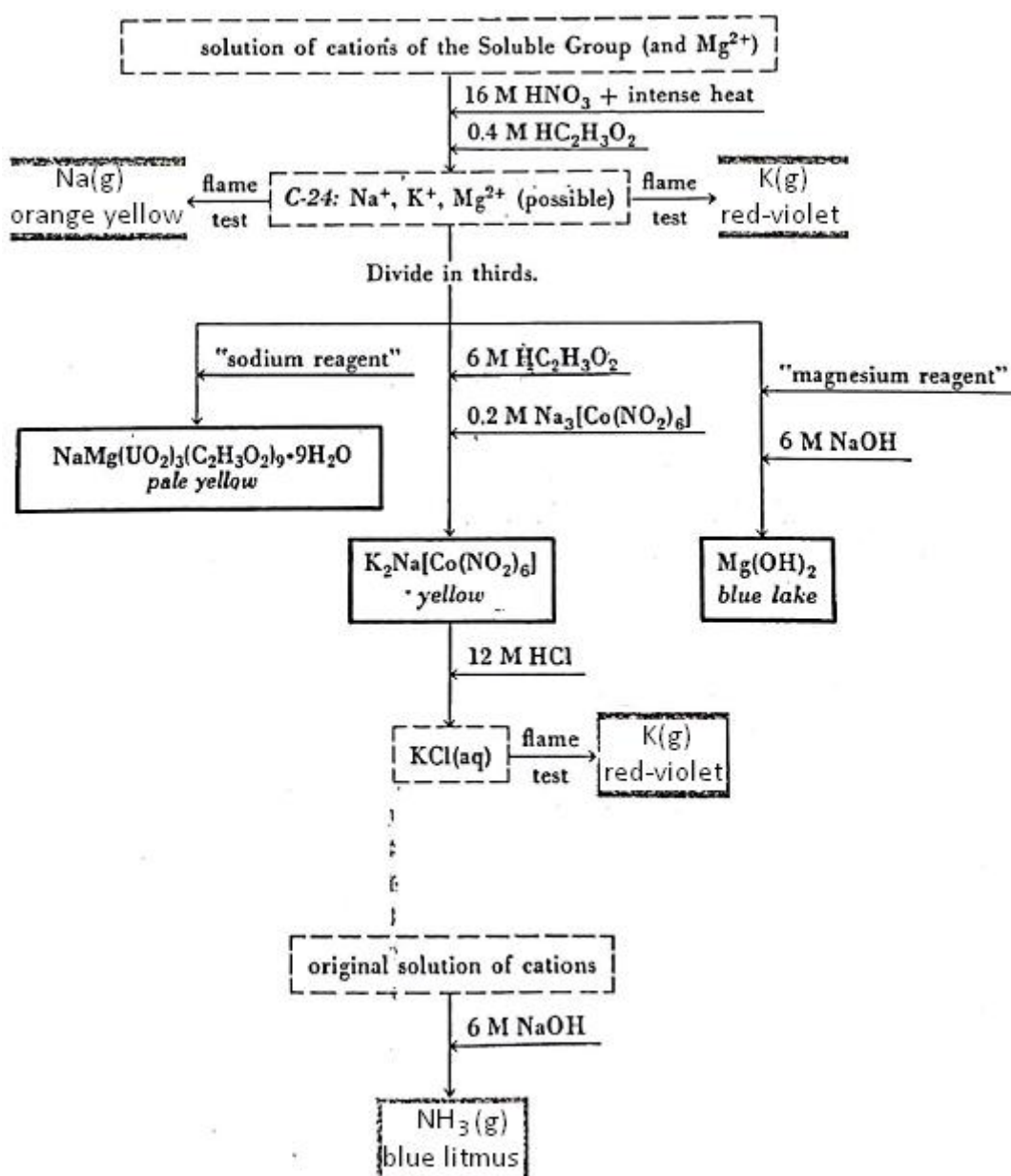
Barium(II), strontium(II), calcium(II), and magnesium(II) ions are called carbonate group due to their precipitation as carbonates by $(\text{NH}_4)_2\text{CO}_3$.



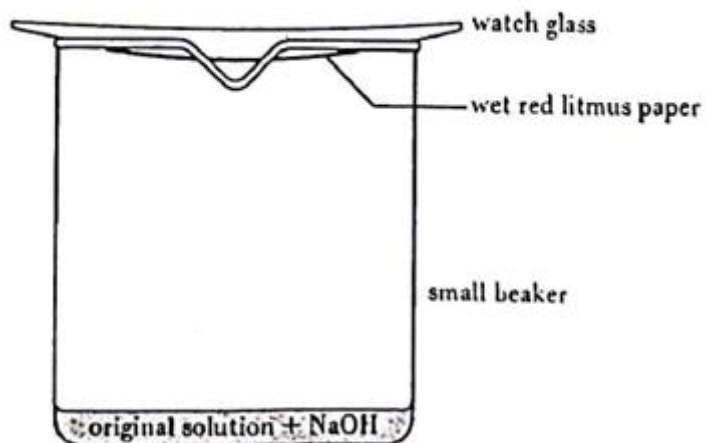
Qualitative analysis flowchart for The Carbonate Group

Cation Group 5: The Soluble Group- Na^+ - K^+ - NH_4^+

- The cations that are not precipitated as chlorides, sulfides, hydroxides or carbonates comprise the soluble group.
- Flame tests are used for Na^+ and K^+ . Since the physical and chemical properties of ammonium ion is similar to sodium and potassium ions, it can interfere the analysis of these ions. Therefore, a thermal decomposition of NH_4^+ step is performed before Na^+ and K^+ identification procedures.
- NH_4^+ is qualitatively analyzed in the original sample.



Qualitative analysis flowchart for The Soluble Group



The separate test for ammonium ion

REPORT FOR QUALITATIVE ANALYSIS

Name- Surname:		Number:	
Sample No	5	Date	
Sample Name	Cation groups 1-5 mixture		
Ions expected to be observed	To be filled by the assistant		
Analysis of ion under study	Procedure and Observation	Precipitation-Identification reactions for the ion	
Result			