

Student's Name

Professor's Name

Course

Date

Lab Report

Objective

The aim of the exercise was to separate and identify group I cations (Ag^+ , Hg^{+2} and Pb^{+2}) from an unknown chemical solution containing the three ions. In addition, the net ionic equations for each step in the experiment were also to be written.

Procedure

The experiment began by separating group I cations (Ag^+ , Hg^{+2} and Pb^{+2}) from a known solution by following the procedure outlined in the Lab Manual. All the changes were noted. After this step, group I cations were separated from the solution, adhering to the same procedure used for the known solution. The observations were then compared to the changes discerned in the known solution.

Data and Observations

A white precipitate was noted after adding 6M of hydrochloric acid (HCl) to the unknown solution. The solution was reacted with chromate (CrO_4), which produced a yellow precipitate. The addition of 6M of ammonia (NH_3) to the white precipitate obtained after the addition of hot water turned into a grey/black precipitate. Lastly, after adding 6M of nitric acid (HNO_3) to the grey/black precipitate, white precipitate did not form.

Interpretations and Conclusions

A white precipitate was noted after adding 6M of hydrochloric acid (HCl) to the unknown solution, which was an indication of the presence of either Ag^+ , Hg^{+2} or Pb^{+2} . The solution obtained after adding hot water gave a yellow precipitate when reacted with chromate

(CrO₄). The yellow precipitate confirmed the presence of Pb⁺². Lead (II) chromate (PbCrO₄) has a yellow color and is insoluble in water. The addition of 6M of ammonia (NH₃) to the white precipitate obtained after the addition of hot water turned into a grey/black precipitate. Hence, the presence of Hg⁺ was confirmed. A white precipitate was not observed after adding 6M of nitric acid (HNO₃) to the grey/black precipitate. Thus, the unknown solution did not contain Ag⁺. Overall, it was deduced that the unknown solutions contained only Hg⁺² and Pb⁺².

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