Group I, Precipitation of Insoluable Chlorides

Thursday, March 15, 2007
1:57 PM

Purpose: To find which analytical Group I cations are present in an unknown sample

Equations:

1) Analytical Group I (Ag^+, Pb^{2+}, Hg^{2+}_2)
2) $Hg_2Cl(s) \rightarrow Hg^{2+}_2(aq) + 2Cl^-(aq)$ Least soluble Chloride
3) $AgCl(s) \rightarrow Ag^+(aq) + Cl^-(aq)$
4) $PbCl_2(s) \rightarrow Pb^{2+}aq) + 2Cl^-(aq)$ Most soluble chloride
5) $PbCrO_4(s) \rightarrow Pb^{2+} + CrO_4^{2-}$
6) $Hg_2Cl_2 + NH_3 \rightarrow Hg + HgNH_2Cl + NH_4^+ + Cl^-$
7) $[Ag(NH_3)_2]^+ + Cl^- + 2H^+ \rightarrow AgCl(s)$ + white preciptiate

Procedure: Listed from handout "Group I, Precipitation of Insoluble Chlorides" by unknown author.

Hazards: Lead, mercury, and chromate are toxic

Data/Observations:

Unknown #grp, 1-109

A. Preciptiatio nof Group I Chlorides
   When added 12M HCl and 6M nitric acid, it fizzed and there was a white precipitate.

B. Separation and Identificaton of Lead Ion
   When added K_2CrO_4 to solution a mustard yellow precipitate formed.

C. Separation of Silver from Mercury, and Identification of Mercury (I) Ion
   When added 5 additional drops of ammonium hydroxide, no black or gray residue formed.

D. Identification of Silver Ion
   After 2 drops of 6M nitric acid, the blue litmus paper turned pink.
   No precipitate or cloudiness observed.

Conclusion:

We found that our unknown # 1-109 only contained led since we observed a yellow precipitate in step A.