9-24-18 - Protocol to Separate Two Solids by Selective Precipitation

Chloride precipitates Ag^+ and Pb^{+2}:

$Ag^+ + Cl^- \rightarrow AgCl(s)$ white ppt

$Pb^{+2} + 2Cl^- \rightarrow PbCl_2(s)$ Pale yellow, white ppt

When $AgCl(s)$ and $PbCl_2(s)$ occur in the same sample it may be necessary to separate both ions, Ag^+ and Pb^{+2} in order to identify them.

To learn how to do this we will mix both $AgNO_3$ and $Pb(NO_3)_2$, deliberately precipitate both ions with 6M HCl, and then separate and identify both ions:

1. Combine 3 drops $AgNO_3$ with 4 drops $Pb(NO_3)_2$. Mix.
2. Add 15 drops 6M HCl. A white ppt forms.
3. Spin tubes for ~30s. Discard liquid above white pellet. Keep pellet.
4. Wash pellet with ~1mL dH_2O. Spin for ~30s. Discard liquid above pellet.
5. Add 1mL dH_2O. Heat to hot. Do not boil! Mix.
6. Spin tubes hot.

7. Transfer liquid above pellet to new tube. Keep new tubes AND pellets.

8. To the tubes with the liquid test for Pb^{+2} by adding 2 drops K_2CrO_4. Yellow PPt confirms Pb^{+2}.

9. To the pellet: Add 1mL NH_4OH. Mix well. Pellet should dissolve completely.

10. Add 2-10 drops 3M HNO_3. white ppt confirms Ag^+