Lab Prep

Clean beakers and test tubes (make sure small test tubes).

Grab strips of different colored washi tape for labeling.

Grab disposable pipettes.

Fill soap and distilled water.

Separation of Quall II ions:

Separation of Qual II ions done with strong base, NaOH.

Mn^{2+}, Ni^{2+}, Fe^{2+}. Will precipitate as a Hydroxides.

Al^{3+} and Zn^{2+} will precipitate soluble Hydroxides.

Add 2 mL of original solution to small cleaned test tube. (DO NOT USE 2 mL WHEN DOING UNKNOWN)

Add 15 drop of 6M NaOH

Centrifuge and save precipitate and supernate. (Test for incomplete reaction; several drops of 6 M NaOH)

Label supernate "Al & Zn ions".

Dissolve the precipitate with the minimum amount of concentrated Nitric Acid (HNO3) possible.

If necessary heat the solution.

Label dissolved, " Mn, Ni, & Fe ions"

Testing for Mn 2+ Presence

Add approximatly 1/2 of "Mn, Ni, & Fe" to a small test tube. (DO NOT USE THAT MUCH IF DOING QUAL II UNKNOWN."

Add solid NaBiO3 in excess to the solution and centrifuge.

Deep purple solution confirms Mn^{2+} ion presence.

Testing for the presence of Fe 3+

Add remaining 1/2 solution of "Mn, Ni, & Fe" (DO NOT USE ALL IF DOING QUAL II UNKNOWN"

Excess ammonia does not react with Mn the addition is to make Fe a brown precipitate and Ni a blue supernate.

Add 5 drops of $M NH4Cl to the solution

Add concentrated ammonium hydroxide (NH4OH) till it is basic to litmus.

Add additional three drops to check for reaction completion.

Centerfuge & save supernate label for Ni testing

Dissolve percipitate with 6M HCl

Add 5 drops of 0.1M NH4SCN. Presence of blood red color confirms presence of Fe.

Testing for Ni Presence

Complexing agent (Dimethylglyoxime) reacting specifically with Ni ions

Using test tube labeled Ni supernate

Appearance of pinkish red precipitate.

Testing for Al Presence

Addition of acid breaks down Al & Zn Hydroxides to ions

Add HNO3 drop wise to supernated labeled "Zn & Al ions" solution must be basic to litmus paper.

Add 5 more drops after that to insure reaction completion.

Presence of white cloudy percipitate indicated presence of Al ions.`

Centerfuge and save Zn supernate for analysis.

Testing for Zn percipitate

Addition of 6M HCl to supernate Zn+ until solution is acidic to litmus paper

Add 3 drop of 0.2M K4[Fe(CN)6] and stir.

Centrifuge and discard supernate.

Light green precipitate confirms presence of Zn.