Colorimetric estimation of copper

1. Add 2,4,6,8,10 cm3 of CuSO4 to 25cm3 volumetric flasks.\
2. Add 2.5 cm3 of NH3 and add distilled water upto the mark.
3. Shake well to get uniform concentrations.
4. For the blank soln and unknown conc of test soln given, add 2.5cm3 of NH3 and distilled water upto mark.
5. Measure the absorbance of all the solutions using 620nm filter of colorimeter.
6. Note the optical density and plot absorbance against volume of CuSO4

Potentiometric Titration of Iron

1. FAS(Ferrous ammonium sulphate) crystals + 1tt dil H2SO4 +little water 🡪 take 25cm3 into clean beaker.
2. Add 1tt of H2SO4
3. Dip the pt-calomel assembly into the solution and connect to the potentiometer to measure the potential.
4. Add 0.2cm3 of K2Cr2O7 2- from burette. Stir and measure potential.
5. Increment 0.2cm3 and measure pot after each addition.
6. Continue till pot. rapidly increases.
7. Calculate N(iron) and amt of iron in given soln

NV(iron) = NV (K2Cr2O7)  
Amt of iron = N(iron) \* gm equivalent wt of iron

Conductometric

1. Pipette out 50cm3 of acid into clean 200cm3 beaker.
2. Dip conductivity cell in the acid such that the 2 pt electrodes are completely immersed.
3. Cell is connected to the conductivity bridge and conductance is measured.
4. Add 0.2cm3 of NaOH from burette. Stir and measure conductance.
5. Increment 0.2cm3 and measure conductance after each addition.
6. Continue till conductance rapidly increases.
7. Plot the graph of conductance against volume of NaOH

Flame photometry

1. Add 2,4,6,8,10 cm3 of NaCl soln to 25cm3 volumetric flasks.
2. Add distilled water upto the mark to all the solns.
3. Shake well to get uniform conc.
4. To the test soln of unknow conc, add distilled water upto the mark and shake.
5. Switch on the instrument, turn on the glass supply and light the gas at the burner.
6. Dip capillary tube in cell containing water.
7. Stream of air atomised as fine mist draws up liquid.
8. Regulate gas supply as colour of flame turns blue.
9. Adjust flame photometer to zero
10. Feed the various Na solns prepared through the flame one by one including test soln.
11. Note down the flame photometer readings.
12. Plot the graph of readings against volume of of soln.

Viscosity of liq

1. Take a clean dry Ostwald viscometer and fix it to the vertical stand.
2. Using pipette transfer 10cm3 of the given liq into the viscometer.
3. Place it in the water bath such that the big bulb is completely immersed.
4. Suck the liquid above the upper mark of the small bulb of the viscometer.
5. Allow it to flow through the capillary
6. start the stopwatch when the liq reaches the upper mark of the small bulb and stop it when it reaches the lower mark.
7. Note the time and repeat 4 times.
8. Calculate the avg time of flow of liq
9. Remove liq from viscometer, clean it, dry and cool it.
10. Do the same with water and calculate the avg time of flow of water.

Estimation of Cu from e waste

Part A (Preparation of standard Na2S2O3 (sodium thiosulphate soln)

1. Weigh the given Na2S2O3 and tranfer to 100cm3 standard flask using a funnel.
2. Add distilled water and dissolve the salt. And make it upto mark with the distilled water and shake.
3. Rise and fill the burette with this soln.

Part B (Preparation of Cu soln)

1. Take a 25cm3 of PCB soln (e-waste soln).
2. Add 1 spatula of urea and 1tt of distilled water to the soln.
3. Heat it to boiling and cool with ice water.
4. Add NH4OH drop by drop until pale blue ppt is obtained.
5. Dissolve this ppt by adding dil. Acetic acid drop by drop
6. Add 1/4tt of acetic acid and 1tt of KI soln
7. Add 1 tt of distilled water and swirl.
8. Titrate the liberated iodine against the Na2S2O3 in burette until pale yellow colour is obtained.
9. Add 2cm3 of starch soln as indicator.
10. Continue titration till the dark blue coloration disappears leaving behind a white ppt.
11. Repeat part B 2 more times.

Pka

1. Pipette 50cm3 of weak acid into a clean 250cm3 beaker.
2. Insert glass calomel electrode assembly and connect to pH meter and measure the pH.
3. Fill the burette with NaOH.
4. Add 0.2cm3 of NaOH and measure the pH.
5. Increment 0.2cm3 of NaOH and measure ph after every increment.
6. Continue till the pH value is comparatively large.
7. Determine pka using 2 graphs.