Iron by thiocyanate assay

Teacher and technician worksheet

Equipment and materials

Each student or pair of students will require:

- burettes x 3 (for greater accuracy, graduated pipettes could be used)
- 10 cm^3 pipette
- 100 cm^3 beaker x 7
- colorimeter and suitable filter (blue) A solution of the complex displays maximum absorption at 480 nm
- iron(III) ammonium sulfate solution containing 0.050 g dm^{-3} Fe^{3+} (50 ppm) (15 cm^3)
- ammonium thiocyanate solution, 1 mol dm^{-3} (70 cm^3)
- solution of unknown Fe^{3+} concentration (10 cm^3)

Make sure students wear eye protection.

Solution preparations

- Iron(III) ammonium sulfate solution, 0.050 gdm^{-3} Fe^{3+} (50 ppm)

  Measure 0.432 g of finely powdered iron(III) ammonium sulfate-12-water into a 100 cm^3 beaker, add 200 cm^3 of 2 $moldm^{-3}$ sulfuric(VI) acid. Set this on a stirrer to dissolve. You may have to leave this over night to fully dissolve, but the stirrer does not need to be on. Add the contents and the washings to a 1 dm^3 volumetric flask. Make up to volume with distilled or deionised water.

- Ammonium thiocyanate solution, 1 mol dm^{-3}

  Weigh 38 g of solid ammonium thiocyanate or 49 g of potassium thiocyanate into a 500 cm^3 beaker. Add about 200 cm^3 of distilled or deionised water and stir to dissolve the solid. Transfer the solution to a 500 cm^3 volumetric flask and make up to the mark with distilled or deionised water.