Determination of thiocyanate using iron(III)

Teacher and technician worksheet

Equipment and materials

Each student or pair of students will require:

- burettes x 3
- 100 cm^3 volumetric flasks x 7 (or use one, thoroughly washing it between samples)
- colorimeter and suitable filter (blue) - a solution of the complex displays maximum absorption at 480 nm
- potassium thiocyanate containing 250 mg dm^{-3} thiocyanate (250 ppm) (30 cm^3)
- iron(III) chloride solution 0.41 mol dm^{-3} (70 cm^3)
- solution of unknown thiocyanate concentration (10 cm^3)

Make sure students wear eye protection. Iron(III) chloride solution is an irritant.

Solution preparations

- Standard solution of potassium thiocyanate containing 250 mg dm^{-3}

  Dissolve 4.5 g potassium thiocyanate in deionised water and dilute to 500 cm^3 in a volumetric flask. This solution contains 5000 mg dm^{-3} thiocyanate ions. Dilute 50 cm^3 of this solution to 1 dm^3 in a volumetric flask. The diluted solution contains 250 mg dm^{-3} (250 ppm) thiocyanate ions.

- Iron(III) chloride solution, 0.41 mol dm^{-3}

  Dissolve 50 g iron(III) chloride-6-water in a beaker in about 200 cm^3 1 mol dm^{-3} hydrochloric acid. Make up to 250 cm^3 in a volumetric flask with more 1 mol dm^{-3} hydrochloric acid.