

NEATH PORT TALBOT COLLEGE COLEG CASTELL NEDD PORT TALBOT

School of Maths & Science Science Practical

Estimation of Iron (II) Using Potassium Dichromate

◆ Aim

To determine accurately the concentration of a solution of iron (II) ions by a titration with a solution of potassium dichromate

◆ Introduction

In acid solution potassium dichromate oxidises iron (II) salts to iron (III). Thus iron (II) can be estimated titrimetrically. Unlike potassium manganate (VII), potassium dichromate cannot act as its own indicator in redox titrations. Although the dichromate ions are orange, during the titration they are converted to green chromium (III) ions which mask the colour of the first drop of excess dichromate at the end point. Thus an indicator must be used, usually an aqueous solution of N-phenylanthranilic acid. This gives a sharp colour change as soon as 1 drop of dichromate is in excess.

◆ Safety

Control Measures



The wearing of **safety glasses** and a **laboratory coat** at all times will be sufficient to take account of most hazards and significant risks.

All waste is to be placed in the labelled container immediately after use.

You are reminded of the need of good laboratory practice in order to maintain a safe working environment.

Hazards



Corrosive

Sulfuric acid



Harmful/ Irritant

Sulfuric acid
Potassium dichromate (VI)

◆ Procedure

1. Weigh out accurately about 9.8 g of the iron (II) salt.
2. Dissolve in sulfuric acid and make up to 250 cm³ with deionised water in a volumetric flask.
3. Pipette 25 cm³ of this solution into a conical flask and add 100 cm³ dilute sulfuric acid followed by 0.5 cm³ of indicator.
4. Titrate with standard potassium dichromate (VI) until the colour changes from green to red-violet.

◆ Questions

1. Write the half equations for the dichromate (VI) ion and iron (II) ion.
2. Hence give the redox equation for the reaction between dichromate (VI) and iron (II) ions.
3. Estimate the percentage of Iron (II) in the salt.