

Balancing a redox reaction

Introduction

In this practical, you will perform a redox titration, the purpose of which is to calculate the amount of iodide ions which react with each mole of iodate(V) ions in aqueous solution. You will have to record your experiment according to Good Laboratory Practice (GLP).

You are supplied with the following laboratory reagents:

2M hydrochloric acid
0.2% starch suspension
distilled water



Methods

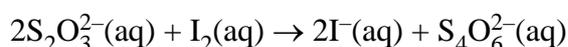
1. You are supplied with one further reagent already made up for you.

Before you start, you will need to **accurately** make up two of the following reagents:

1M potassium iodide solution
0.10M potassium iodate solution
0.10M sodium thiosulphate solution

Show all the measurements and calculations you needed to make up your two reagents, according to GLP. This requires you to write down date and title of the experiment, preferably in a bound laboratory book. You must write down the name, full formula and relative formula mass of each solid you use, and show your calculation of the quantities and volumes required to reach the target concentration. When weighing, you must note down the mass of the weighing boat, the mass of the boat plus solid, and write down the subtraction needed to find the weight of solid. Any alterations should be made by putting a single line through the original, and writing the correct version above it (the original must still be visible).

2. Fill one burette with 0.10M potassium iodate solution, and the other with 0.10M sodium thiosulphate solution.
3. Pour about 10cm³ of potassium iodide solution into a 250cm³ conical flask. Add about 10cm³ of dilute hydrochloric acid, then add **precisely** 5.0 cm³ of 0.10M potassium iodate solution.
4. Titrate the iodine formed against 0.10M sodium thiosulphate. When the colour of the iodine has almost gone, add 1–2 cm³ of the starch suspension, and continue the addition of thiosulphate solution dropwise until the blue colour disappears.
5. Record your burette readings in a suitable results table.
6. Repeat steps 2 to 5 once or twice to check your accuracy.
7. Use the equation below to calculate the amount of iodide ions that reacts with each mole of iodate ions.



A number of calculations are needed; ensure that the you show all your reasoning and working out.