Chemistry 264
Practical 1

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Abstract

In this practical a sodium hydroxide solution is standardised by titration with oxalic acid. Phenolphthalein was used as an indicator.

Contents

1 Introduction

In this practical we carry out a series of acid-base titrations in order to standardise a sodium hydroxide solution. First an oxalic acid solution was prepared with a known concentration, which was then used to titrate the sodium hydroxide solution. Phenolphthalein was used as an indicator, to identify the equivalence point of the titrations.

2 Results

We find that our titrations were relatively consistent, figure 1 shows the concentration of NaOH, calculated over five titrations. These values have a relative standad deviation of 1.569 as can be seen in table 1, which also shows the mean and CI values.

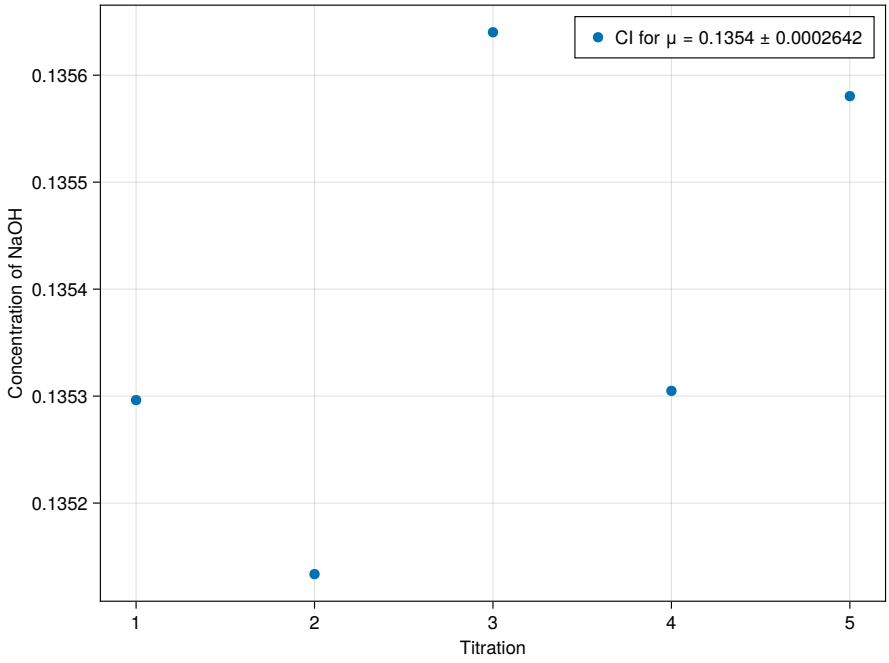


Figure 1: Concentration of NaOH

Table 1: Supplementary Data

Mean	RSD	CI
0.1534	1.569	0.1351 - 0.1357

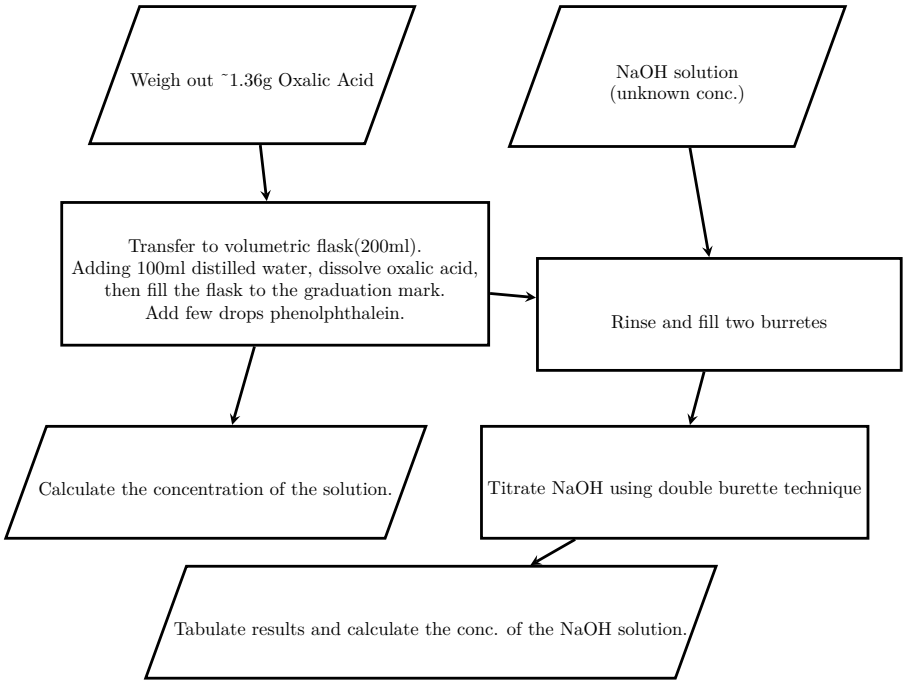
A static export of the notebook containing all analysis and figures is availible at `https://adammenne.github.io/chemistry_264/practical_1/plots.html`. With full source code availble at `https://github.com/AdamMenne/chemistry_264/tree/master/practical_1`

3 Discussion

From the titrations that were carried out, the metrics of relative standard deviation and confidence intervals for the mean, show that the titrations were consistent and precise.

However improvements are possible by increasing the number of titrations carried out, and utilising a more accurate and precise method of identifying when the equivalence point has been reached.

Appendix A Flow diagram



NaOH

- Corrosive

- avoid contact with skin and eyes

- wash immediately if contact occurs

Oxalic Acid

- Corrosive
- Harmful

- avoid contact with skin and eyes, do not ingest.

- wash immediately if contact occurs

Appendix B Pre-Practical Questions

pH values for questions 1 through 5 are shown in table 2. Figure 2 is a plot of these vales to produce a titration curve.

Table 2: Titration

HCl (ml)	pH
0	10.972
10	9.421
12.5	9.245
25	5.361
26	2.881

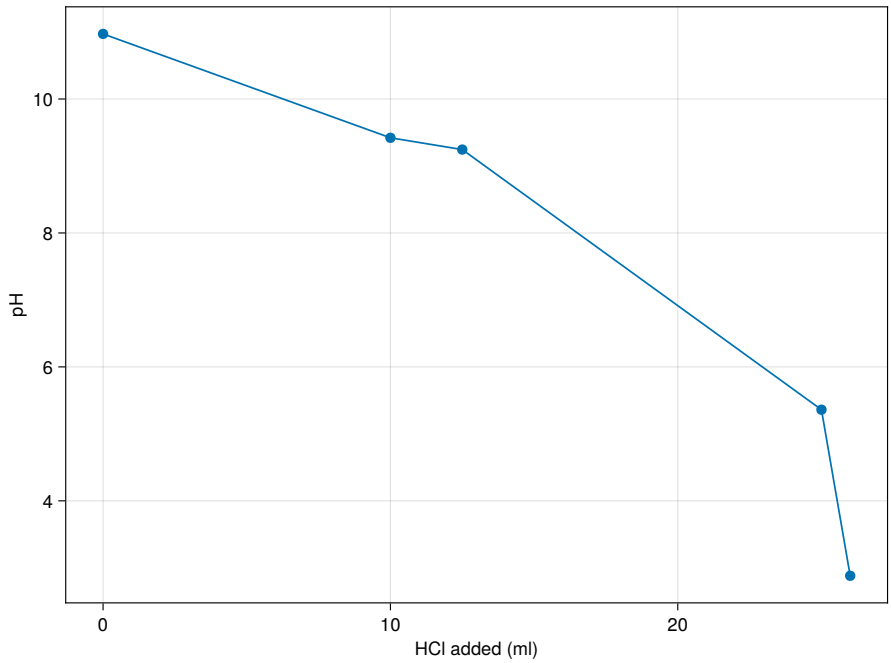


Figure 2: Titration Curve