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# Detection of Oxalate Ions in Spinach, Radish and Beetroot

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**ABSTRACT**

*The report provides an outlook on the concentration of oxalate ions in three chosen samples, namely spinach (a leafy vegetable), radish (a root vegetable) and beetroot ( another root vegetable).Spinach, Radish and Beetroot are three of the widely used vegetables commercially ( as in hotels) as well as domestically. Therefore if even one of the above three samples has high concentration of oxalate ions then it will prove harmful in the long run.*

***Keywords: Equivalent Mass,Normality,Oxalate Ion, Redox Reaction, Titration***

## I.INTRODUCTION

In this project we have calculated the concentration of oxalate ions in three samples using titration against potassium permanganate solution. This experiment thus provides us with a brief idea as to which of the three samples is harmful for us in the long run and which is not. This report is made to make people aware about the same. Previously work has been done on other samples such as guava and other fruits.

## II.RESOURCES

1.Spinach
2. Radish
3. Beetroot
4. Potassium Permanganate solution
5. Dil. Sulphuric Acid
6. Phenolphthalein
7. Methyl Orange

## III. PROCEDURE

1. Weigh 50g of each sample and crush it to a fine pulp.
2. Transfer the crushed pulp to a beaker and add 50 ml dilute sulphuric acid to it and boil it for approximately 10 minutes.
3. Cool and filter the boiled contents. Pour the filtered contents in a 100 ml measuring flask and dilute the contents upto 100 ml using distilled water.

4. Pipette out 10 ml of the solution from the flask into a titration beaker and add another 10 ml of dilute.sulphuric acid to it. Heat the mixture and titrate it against 10% potassium permanganate solution in a burette using methyl orange and phenolphthalein ( whichever is suitable) as an indicator .The end point is appearance of light yellowish orange ( for methyl orange ) and light pink colour ( for phenolphthalein).
5. Repeat the procedure similarly for other two samples.

## IV. FIGURES AND PICTURES

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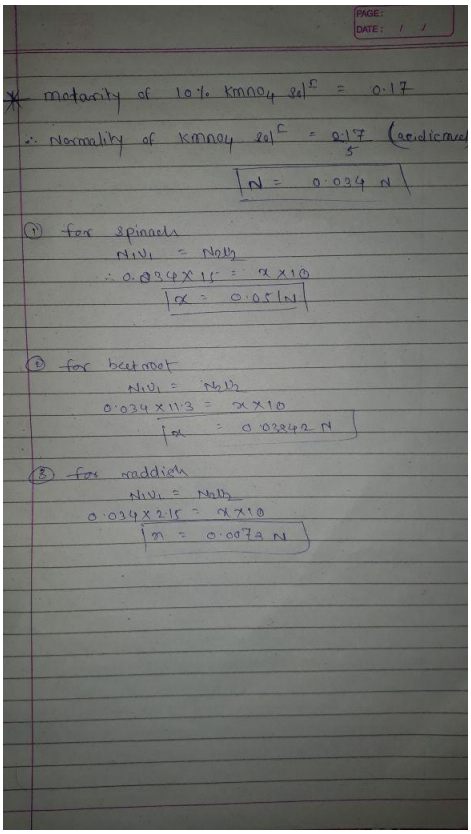


## V.CONCLUSION

From the performed experiment we have found following results:

1. The normality of spinach was 0.255N
2. Normality for beetroot is 0.1921N
3. Normality for radish is 0.0365N

And we know that normality if a solution is directly proportional to the ions present in that solution. Therefore we can say that normality of the above samples is directly proportional to the number of oxalate ions present in it.

Therefore we can conclude that spinach contains the highest number of oxalate ions and radish contains the least.

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