

ORIGINAL RESEARCH

Determination of L-Ascorbic Acid Quantities in Vegetables by Using 3% Acid-Alcohol in Iodine Redox Titrimetric Method

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Abstract

The main objective of this study was to determine the suitability of using 3% acid-alcohol in iodine redox titrimetric determination of L-ascorbic quantities in chlorophyll-green vegetables. The main challenge in the protocol has been detection of titration end-point vegetables samples with high concentration of chlorophyll in the leaves. Chlorophyll doesn't contrast with the blue-black color noticed at the end-point. This project therefore developed a modified iodine titration procedure that enhances the accuracy of end-point detection using an acid-alcohol. The analysis of vitamin C content was done by using iodine titration. In the titration, a 0.005molL⁻¹ Iodine solution as a titrant, 0.5% starch as an indicator solution and vegetable samples containing the analyte L-ascorbic acid were used. The quantities of L-ascorbic acid content in different vegetables were determined using the novel titration method. For control experiments, vitamin C in orange fruits juice was determined. The visibility of the end points in orange fruit and vegetables were compared. The vegetables tested were Sukuma wiki, green pepper, spinach and cabbages. Three titration experiments were done to determine the average titer volumes of iodine solution used. The volume was used to determine the mass of ascorbic acid reacted in the samples of vegetables analyzed. The results were Orange 53.0gma/100g, collard greens 35.0gms/100g, green pepper 80gms/100g, spinach 27.5gms/100g and cabbage 36gms/100g of fresh weight. A two-sample t-test assuming equal variances used in the analysis of significant difference between the mean of masses of L-ascorbic acid in this study and the mean of masses in the previous study. Given $\alpha=0.05$ and $p=0.99$, it was confirmed that there was no significant difference between the means. The results of the study were thus consistent with those of previous findings. A 3% acid-alcohol proves to be efficient in decolorization of chlorophyll to achieve a clear end-point during titration of vegetable samples. However, more studies should be done on other vegetables to validate the findings of this study

Key words: L-ascorbic acid, 3% acid-alcohol, titration, vegetables