

Minor Research Project in Chemistry

On

"Study of Analytical Applications of B-Z Oscillating Reactions with reference to Kinetic investigation of vitamin 'C' content and hence the Antioxidant property of Fruits and Vegetables extracts"

Vide UGC Letter No.MRP(S)-1076-11-12/KAGU020/UGC-SWRO

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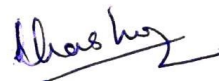
SUMMARY

Vitamin C also known as Ascorbic acid found in fruits & Vegetables is an essential nutrient for humans and certain other animals. Applications of B-Z Reaction in Analytical chemistry have grown substantially in past few years. The method is highly reliable owing to its sensitivity, reproducibility, accuracy, and above all its precision. It is not costly and is highly affordable in involving simple instrumentation.

In this work all investigated aqueous extracts of vegetables and fruits available in plenty at lesser costs in and around places of Raichur were found to have high levels of vitamin 'C' using B-Z reaction method, thus provided good antioxidant properties and the related biological activity. The principal component analysis (PCA) proved to be very useful tool to identify the most effective variables & their relationships.

Like other methods the B-Z reaction method is also based on the generation of free radicals in the reaction mixture. Antioxidant & scavengers of free radicals added to an active oscillatory B-Z regime cause an immediate cessation of the oscillatory regime, an inhibition time that linearly depends on the amount of the antioxidant added and subsequent regeneration of oscillations. The B-Z reaction methods works at pH approximate to 2, which is similar to that of the fluids in the human stomach. It is known that a vegetarian diet can reduce the risk of stomach cancer and it is therefore interesting to determine the activity of antioxidants at low pH value. Aqueous extracts of fresh vegetables and fruits available in and around places of Raichur were tested with the B-Z reaction method, recording potentiometrically the inhibition times produced by their extract on an active B-Z mixture is found to be within desirable limits.

Understanding of the onset of exotic phenomena of B-Z reaction in chemical system has provided important insight into the formation of similar behavior in nature. As opposed to non-linear systems in physical and biological areas, in which control parameters are often in accessible or difficult to adjust. Chemical reactions can be conveniently manipulated through adjusting the initial concentration of each reagent, temperature or flow rate so that better results could be obtained which in turn creating awareness for agriculturist cultivating fruits and vegetables for the target areas from where these samples were collected.



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Place : Raichur