ISSN No:-2456-2165

Flame Photometric Determination of Lithium in Red Kidney Beans, Lentils and Teen Talav Water

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Abstract:- Quantification of Lithium is drawing interest because of its industrial usefulness, physiological and biological importance. Flame emission spectrophotometry is mainly used for the analysis of many metals that undergo ionization in a flame. Flame photometric analysis is an easy and sensitive analytical technique for determinations of group one and two metal ions. Li content within the samples of red kidney beans, Lentils have been analyzed .Also teen talav water sample ,collected from Chembur area immediately after Ganesha Visarjan have been analyzed for Lithium content the amount of lithium in the water sample was estimated to be 4 ppm. The utilization of flame emission measurements, however would offer a speedy analysis of Lithium in different samples.

Keywords:- *Li Analysis, Flame Photometry, Lentils, Red Kidney Beans, Talav Water Sample.*

I. INTRODUCTION

Metal ions investigation of first and second group has significance to several technological and medical areas. Hence accurate investigation of metal is very important during a wide choice of applications.(1)The discovery of first flame photometer made it accessible commercially within the Forties.(2)

Instrument flame emission photometer is based on principle of atomization of a sample solution, when aspirated into a flame. This is followed by isolation of their characteristic emission spectral of a particular metal ion and detection and measurement of the intensity of this emission. Energy for excitation of atoms or molecules can be applied by heating or by electricity. Flame is used for low temperature excitation, manufacturing temperatures from a thousand to three thousand degree Celsius. Main reason behind this is that the low temperature of the flame excites only the group one elements like sodium, potassium ,Lithium etc., the lower states of the group 2 elements and, to a lesser extent, other elements, if compared comparison to the other emission sources .(3)

Li has were given interest due to the significance given to the management of dietary salt consumption, the consequential want for improved data .Li is an extremely micro element, highly little investigated. Experimental proofs demonstrate that Lithium is an vital and correct quantity of Li typically has a beneficial effect on human conduct.(4,5) Some of the experiments have proven that behavioral defect are caused due to low intake of Lithium.(4,6) This had been confirmed by means of a survey accomplished in Japan.(7)The minimal intake of Li was found to be much less than one hundred microgram in a day .(4)The provisional recommended day by day intake of Li is found to be 14300 mg per kilogram of weight of body for age group above twenty one .(8) Lithium mainly found in the diet are grains, potatoes and animal-derived ingredients.(9) One of the aim of the present study is analysis of Li in different samples.

II. EXPERIMENTAL

❖ *Materials*

Lithium carbonate(anhydrous), sodium chloride (AR) Deionized water. Water sample collected from teen talav , chembur area Instrument: Micro controller based Flame photometer Calcium and Lithium filter, Systronic (India) Limited ,Model 128 was used in this study

❖ *Methods*

The Micro controller based Flame photometer was calibrated as per the instruction given in the brochure. Solutions of known concentration of Lithium were prepared and emission intensity was measured .All measurements were carried out twice.

Also background reading was noted for each solution with deionized water.

A. Preparation of standard solution:

Stock Lithium solution: Dissolve 0.396 g of Li_2SO_4 (Dried for 1 hr at 180°c) in deionized water and dilute to 500 ml. The lithim concentration of this solution is 100 ppm.

B. Procedure:

- A Series of standards containing 2-30 ppm of Lithium were prepared by appropriate dilutions of the stock solutions.
- Deionized water was aspirated to set the red out meter at zero.
- Standard solutions of highest concentration was aspirated.
- Emission intensity were noted for all standard solution

- 2 gm of the beans powder and lentils were placed separately in the thimble of soxhlet extractor and 100 ml of water was used as an extracting agent. It was extracted for 4 hrs. The solutions were cooled, filtered and diluted further up to 100 ml
- Water sample was collected from teen talav , chembur area after Ganesha visarjan .50 ml of filtered water sample was boiled and reduced to 20 ml. The resulting solution was cooled, filtered using whatmann filter paper and diluted to 25 ml .

III. RESULTS AND DISCUSSION

The concentration of Lithium present in water sample collected from Teen talav, chembur was analyzed during Ganapati visarjan. Graph of emission Intensity verses concentration of Li^+ in ppm was plotted. The concentration of Lithium ions present in water sample was found to be 4 ppm . Concentration of Lithium in red kidney beans and lentils both tested negative. The extract was spiked with known amount of lithium and then analyzed .The results were in good agreement with the amount added.

IV. CONCLUSION

The simplicity and accuracy of this method made it possible to analyze unknown samples without even knowing the formulations. Such experiments can be included as a project work for undergraduates. Apart from this, it will also help to work using the eco-friendly methods. All those involved in the conservation of environment have been suggested a slight variation immersion of the idol ritual to avoid pollutants in water.

Sr. No.	Concentration of Li^+(ppm)	Emmission Intensity
1	5	3
2	10	8
3	15	14
4	20	19
5	25	26
6	30	30
7	*Beans(added 10 ppm Li)	8
8	*Lentils(added10 ppm Li)	10
9	Talav water	04

Table 1:- Estimation of Lithium with known concentration and sample *Tested negative.

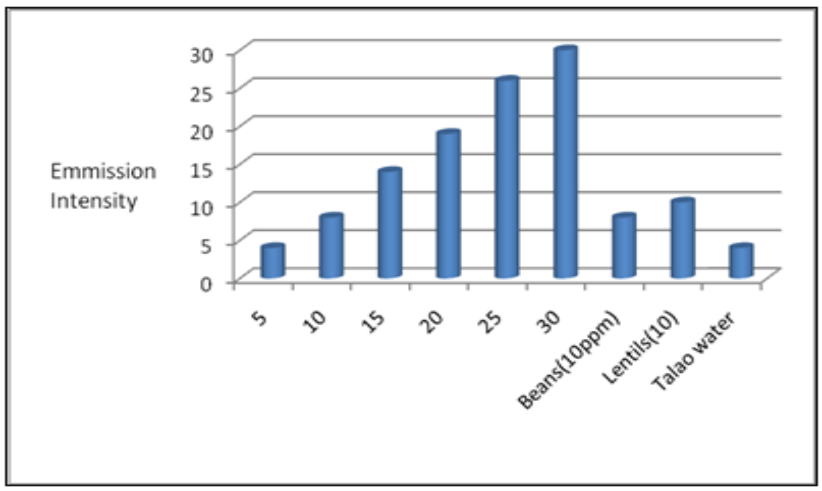

Fig 1:- Estimation of Lithium with known concentration and sample

ACKNOWLEDGMENT

The authors gratefully acknowledged the use of central instrumentation facilities at V.E.S College of Arts Science & Commerce funded by FIST-DST (Ministry of Science & Technology, Department of Science & Technology).The Authors are also thankful to Principal, V.E.S. College for providing all the support.

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