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FLAME PHOTOMETRIC METHOD FOR THE ESTIMATION OF IODINE IN COMMON SALT OF DIFFERENT BRANDS

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ABSTRACT

A simple, rapid, sensitive and precise flame photometric method has been developed for the quantitative estimation of Iodine in common salt. Working range of concentration was found to be between 3.246 to 110.357mcg/ml. Regression equation was found to be y = 0.8036 x + 0.3273 and coefficient of correlation was 0.9994. The recovery studies confirmed the accuracy of the proposed method

KEYWORDS

Flame photometry, K-filter, Iodine, Potassium Iodate, Equivalent factor

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INTRODUCTION

Iodine is an essential constituent of thyroid hormone and therefore essential for normal life. Daily requirement of iodine for an adult human is 0.05mg whereas in children, requirement is more. It's deficiency causes goitre[1-2]. Common salt is the main source of iodine. In common salt, iodine is present in the form of Potassium Iodate (KIO_3)[3]. There is no reported analytical method available in literature for the estimation of Iodine in common salt. A simple, rapid and economical Flame Photometric method (F.P.M.)[4-5] has been developed for the estimation of iodine in common salt. The developed method may be useful for small scale industries and research organizations.

MATERIALS AND METHODS

Potassium Iodate A.R. grade was obtained from the Qualigens (India). and common salt was procured from the market. Deionised water was used as a solvent. All measurements were made on Systronia Flame Photometer, serial no. 3883.

Standard Preparation

About 10.9468mg of potassium Iodate (i.e. equivalent to 2mg of potassium or 6.4916mg of iodine) was weighed accurately and dissolved in 50ml of 0.01% NaCl Solution to get concentration of potassium 40mcg/ml. This was used as a stock standard, different aliquots taken from stock standard in a series of 10ml volumetric flasks and volume was made up with water to get concentration range of 1-40mcg/ml for potassium. Using K-filter, percentage emission was recorded using 0.01% sodium chloride solution as blank. Calibration curve was plotted between concentration Vs percentage transmission (Figure I). Working range of concentration was found to be 1 to 34mcg/ml for potassium or 3.246 to 110.357mcg/ml for iodine.

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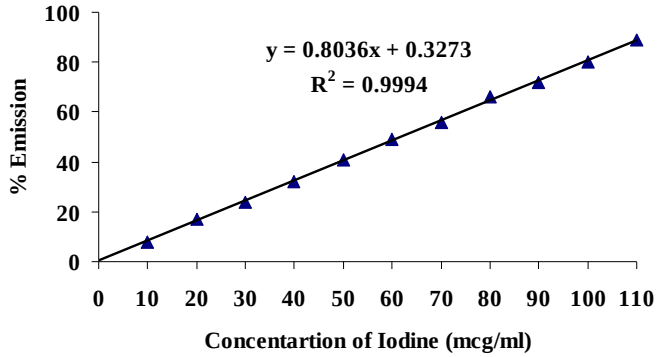
Figure 1

Calibration Curve for Iodine



Sample Preparation

For determination of iodine in commercial common salt by the proposed method, 25mg salt of each brand were weighed separately and 25mg of pure Potassium Iodate was added to it in order to increase the contribution of iodine because the amount of iodine in common salt is very less and can't be detected. This sample is dissolved in deionised water in 250ml volumetric flask. The resulting solution was diluted to have concentration in between the working range obtained. The emissions of the resulting solutions were measured and quantity of iodine in sample solution was calculated using regression equation and equivalent factor.

Equivalent Factor used for Iodine calculation

Each gram of Potassium ≅ 3.2458 gram of Iodine

RESULTS AND DISCUSSION

To evaluate the validity of the proposed method, known amount of pure Potassium Iodate was added to the previously analyzed preparations and the mixture were analyzed by the proposed method and obtained percentage recovery were obtained (Table I). To anull the interference by the presence of sodium chloride, the standard solution of Potassium Iodate was made in 0.01% sodium chloride solution. In conclusion, the proposed method is most simple, sensitive and accurate and can be used for routine estimation of iodine in common salt.

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Table I

Estimation and Recovery studies of commercial salt of different Brand

Brand	Amount of Salt Taken (mg)	Amount of Iodine found* (per 10^6mg) Mean ± S.D.	Actual Amount of Iodine in salt (PPM) found	Recovery Studies		
				Amount added (mg)	Amount* found (mg)	% recovery
Brand I	25	59315 ± 2.0	15	40	39.42 ± 0.21	98.55
Brand II	25	59312 ± 1.0	12	30	30.26 ± 0.33	100.87
Brand III	25	59314 ± 2.0	14	20	20.18 ± 0.23	100.90

**Mean of three determinations*

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FLAME PHOTOMETRIC METHOD FOR THE ESTIMATION OF IODINE IN COMMON SALT OF DIFFERENT BRANDS

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