DEVELOPMENT OF SPECTROPHOTOMETRIC METHOD FOR DETERMINATION OF FE (III) IN FOOD SAMPLES

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INTRODUCTION

Spectrophotometric determination of various metals with hydroxytriazenes as reagents has been extensively done in our laboratory during the last few years as is revealed by the appearance of reviews published. Since hydroxytriazenes offer low cost and simple methods for metal determination, the present work has been centered upon the use of these reagents in Fe(III) determination in food samples.

The general procedure for the determination of Fe(III) in food samples has been based on the methods of colorimetric determination of Fe with 1,10- phenanthrolene by use of calibration graph using different hydroxytriazenes instead of 1-10 phenanthrolene.

GENERAL METHODOLOGY

1. Preparation of sample:

According to the procedure given in the method of analysis of plants, 5gm, the sample was digested with the 25 ml. each of the concentrated nitric acid and perchloric acid till the solution was clear. A final volume was made up to 100 ml.

GENERAL PROCEDURE FOR DETERMINATION OF Fe (III) IN FOOD SAMPLES:

In the method based on the formation of iron-hydroxytriazene complex instead of Fe-1, 10 phenanthrolene complexes following steps were involved:

(i) A suitable wavelength (max) for Fe (III)–hydroxytriazene complex was selected by recording absorbance of the complex regarding the blank sample for each system.

(ii) The effect of pH was studied to know a suitable pH range where iron hydroxytriazene complex had constant and maximum absorbance. The subsequent work was done in this pH region for each hydroxytriazenes.

(iii) The mole ratio (Fe: hydroxytriazene) was determined for each system by taking the absorbance at different molar compositions of iron hydroxytriazene complex.

(iv) The validity of Beer's law was verified for each system by plotting the absorbance against the concentration of the sample taken.

(v) A calibration graph was prepared by recording the absorbance of each complex formed by the standard iron solution and hydroxytriazenes at various concentrations.

(vi) The absorbance of the complex formed by each hydroxytriazene and stock iron solution in each food sample was recorded.

(vii) The respective concentration of iron in each food samples was determined by reading the absorbance value of the complex formed by a food sample in the calibration graph.

RESULT

It has been observed that the contents determined from the calibration graph more or less precisely agreed with the contents of iron reported in the particular food samples, proving the validity of the method. However the slight variation in the values from reported ones if any were due to variation due to seasonal or geographical reasons, in food samples sources.

REFERENCES

[1] A.K. Goswami and D.N. Purohit, Analytical Sciences, 2001, 17, 789-791.
[2] A.K. Goswami, Pesticides Res. Journal, 2002, 14(2), 213.
[3] G. Murr and B. W. Rockett, Practical inorganic Chem., Van Nostrand Reinhold Company, 1972, 111.
[4] Gena Ram; R.S. Chauhan; A.K. Goswami and D.N. Purohit, J. Indian Chem. Soc., 2003, 80, 659-660.
[5] Gena Ram; R.S. Chauhan; A.K. Goswami and D.N. Purohit, J. Indian Chem. Soc., 2004, 81, 896-97.
[6] I.S. Hura; Neelam Naulakha; A.K. Goswami and M.K. Shrivastava, Indian Journal of Microbiology, 2003, 43(4), 275-276.
[7] Krishna K. Paliwal; Deepika K. Gorji; Sanjay Kumar; Neelam Naulakha; A.K. Goswami and D.N. Purohit; Asian J. Chem., 2001,13(1), 299-304.
[8] Methods of Analysis of Plants, 1961. Anjali Goswami, Master of Science (M.sc.) thesis entitled "Relative efficiency of Iron rich food mixture vis-a-viz synthetic iron preparation in curing anaemia", 1991.
[9] Neelam Naulakha and A.K. Goswami, J. Indian Chem. Soc., 2004, 81, 438-439.
[10] Rajendra, S. Shekhawat; Rakesh S. Shekhawat; Raveendra Singh; R.S. Chauhan; A.K. Goswami and D.N. Purohit; Asian J. Chem., 2001,13(2), 783-784.
[11] Saba Khan; Rekha Dashora; Anita Mehta and A.K. Goswami, J. Indian Chem. Soc., 2003, 80, 793-794.
[12] Tushita Babel; Saba Khan; Anita Mehta; R.S. Chauhan and A.K. Goswami, J. Indian Chem. Soc., 2004, 81, 799-800.