IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Analysis Of Monosodium Glutamate In Food Products By Using Analytical Technique

ANJITHA K[1], [2], FATHIMATH ZEHARIYA A.K[2] , FATHIMA.T.M[3], SAMEENA S[4],SANDRA P[5]
[1]ASSISTANT PROFESSSOR,
[1,]DEPT. OF PHARMACEUTICAL CHEMISTRY,
[1,]PRIME COLLEGE OF PHARMACY, PALAKKAD, INDIA

Abstract ; This study is aimed to elauvate monosodium glutamate content in food items. In the study prepration and analysis of sample and prepare the standard solution while same procedure. Monosodium glutamate stock solution was prepared by dissolving 3g of pure monosodium glutamate in 20ml of distilled water and filtered. Then from the filtrate 1 ml,2ml,3ml,4ml,5ml is pipette out. Add 4ml of freshly prepared 0.5% ninhydrin solution and heat under waterbath until blue color is appeared. Cool the solution and absorbance is measured using uv visible spectrophotometer at a wavelength of 571nm. In the ninhydrin test, a solution of different samples of food products was added with 0.5% ninhydrin reagent. Then heated into a water bath for a few minutes so that the ninhydrin could react with free α amino acids found in monosodium glutamate which was indicated by a change in color from clear to blue and the results obtained from the different samples are positive for Monosodium Glutamate (MSG).

Index Terms - Ninhydrin, Monosodium glutamate,

INTRODUCTION

Spectroscopy is the branch of science, which deals with the study of interaction of the electromagnetic radiation with sample substances. The interaction is mainly based upon the absorption or emission of the radiation by the sample. The absorbed or emitted radiation is in the form of quantum energy. Foods have two main functions, i.e. they provide nutrition and an occasion for a pleasurable social event. Both functions are fulfilled only if a food is actually consumed. A food composed of the nutritional elements required for an optimal diet i.e. unattractive and thus not consumed provides no nutrition. Flavouring systems are of vital importance in savoury food manufacturing.Many industrially prepared foods are particularly attractive to potential consumers primarly because of their typical flavours.Therefore it is no surprise that the food industry leading with these product segments shows great interest in the use of food.Flavouring can play an important nutritional role, particularly in foods that are not very flavourful,by providing the needed appeal. Monosodium glutamate (MSG) is the sodium salt of the aminoacid glutamic acid.It is the main component of many proteins and peptides, and is present in most tissues. It is made commercially by the fermentation of molasses, by exists in many products made from fermented proteins, such as soy sauce and hydrolysed vegetable protein. Glutamate is also produced in the body and plays an essential role in human metabolism. It is a major component many protein-rich food products such as meat, fish, milk and some vegetables. However free form of glutamic acid or glutamates has an effect on the glutamate receptors. They became partially free during processing, thereby accentuating their characteristic flavor properties.

CONCENTRATION OF MSG IN VARIETY OF COMMON FOOD:

FOOD	CONCENTRATION(mg/100g)
Cow milk	2
Apple	13
Human milk	22
Eggs	23
Beef	33
Chicken	44
Almond	45
Carrot	54
Onion	118
Potato	102

EXPERIMENTAL WORK

SELECTION OF MAXIMUM ABSORPTION (λ max) OF MSG

The wave length at which maximum absorption of monosodium glutamate was found out by scanning very low concentration of drug. Uv visible spectrum of monosodium glutamate were recorded and was found to be 571nm as it gives good resolution and peak.

PREPARATION AND ANALYSIS OF STANDARD

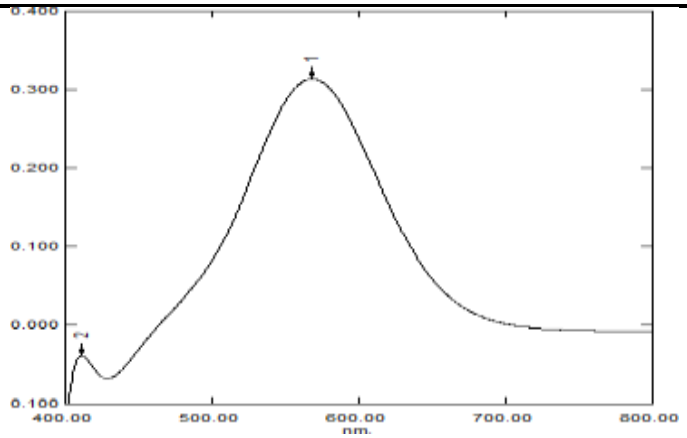
Monosodium glutamate stock solution was prepared by dissolving 3g of pure monosodium glutamate in 20ml of distilled water and filtered. Then from the filtrate 1 ml,2ml,3ml,4ml,5ml is pipette out. Add 4ml of freshly prepared 0.5% ninhydrin solution and heat under waterbath until blue color is appeared. Cool the solution and absorbance is measured using uv visible spectrophotometer at a wavelength of 571nm

PREPARATION AND ANALYSIS OF SAMPLE

Samples of different locally available brands of 5 packed food, 4 instant noodles, 2sauce and 2 masala powders were selected. The packed food items were grinded by using mortar and pestle. Weighed 3g of each samples (packed food items, instant noodles masala) and sauce about 3ml were measured and taken. All samples dissolved in 20 ml of distilled water separately by using measuring cylinder in separate beakers. Then the sample solution filtered by using whatmann filter paper.1 ml of each filtrate was taken from each sample and is added to a 100 ml beaker followed by addition of 4 ml of freshly prepared 0.5% ninhydrin solution and heated under waterbath until blue colour appears. Cool the sample solution and measured absorbance at 571nm by using uv-visible spectrophotometer.

1. SELECTION OF MAXIMUM ABSORPTION (λ max) OF MSG

The wavelength at which maximum absorption of monosodium glutamate was found out by scanning very low concentration of drug. Uv visible spectrum of monosodium glutamate were recorded and was found to be 571nm as it gives good resolution and peak.



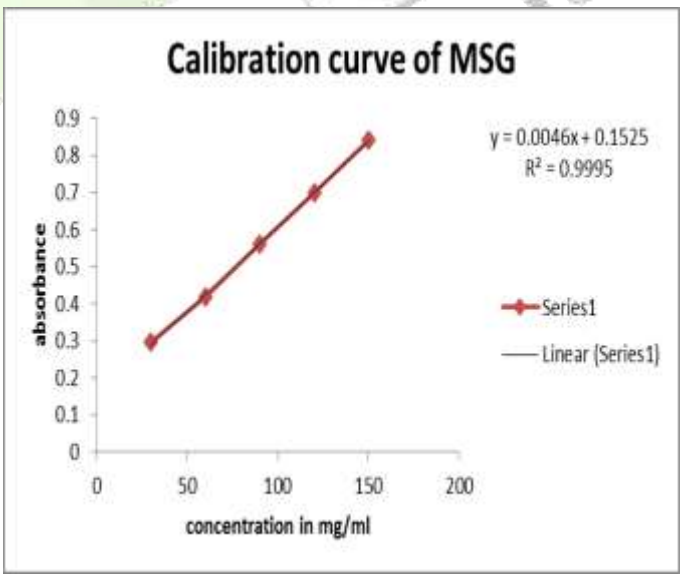
2. PREPARATION AND ANALYSIS OF STANDARD

Monosodium glutamate stock solution was prepared by dissolving 3g of pure monosodium glutamate in 20 ml of distilled water and filtered. Then from the filtrate 1 ml, 2 ml, 3 ml, 4 ml, 5 ml is pipette out. Add 4ml of freshly prepared 0.5% ninhydrin solution and heat under water bath until blue color is appeared. Cool the solution and absorbance is measured using uv visible spectrophotometer at a wavelength of 571nm.

Table 1: Preparation and Analysis of Standard (Msg)

Sl no	Volume (ml)	Concentration (mg/ml)	Absorbance (nm)
1	1	30	0.296
2	2	60	0.420
3	3	90	0.561
4	4	120	0.701
5	5	150	0.841

CALIBRATION CURVE OF MSG



PREPARATION AND ANALYSIS OF SAMPLE

Samples of different locally available brands of 5 packed food , 4 instant noodles, 2 sauce and 2 masala powders were selected. The packed food items were grinded by using mortar and pestle. Weighed 3g of each samples(packed food items, instant noodles masala) and sauce about 3ml were measured and taken. All samples dissolved in 20 ml of distilled water separately by using measuring cylinder in separate beakers. Then the sample solution filtered by using whatmann filter paper.1 ml of each filtrate was taken from each sample and is added to a 100 ml beaker followed by addition of 4 ml of freshly prepared 0.5% ninhydrin solution and heated under water bath until blue colour appears. Cool the sample solution and measured abs at 571nm by using uv-visible spectrophotometer.

PACKED FOOD ITEMS

Table 2 : preparation and analysis of sample-packed food items

Sl no	Food Items	Volume (ml)	Concentration (mg/ml)	Absorbance (nm)
1	Lays	1	240.76	1.261
2	Kurkure	1	308.15	1.570
3	Timepass	1	105.97	0.641
4	Bingo	1	305.97	1.560
5	Mad angles	1	8.15	0.190

INSTANT NOODLES

Table 3: Preparation And Analysis of Sample-Instant Noodles

SI NO	FOOD ITEMS	VOLUME (ml)	CONCENTRATION (mg/ml)	ABSORBANCE (nm)
1	Yippee	1	625.54	3.031
2	Maggi	1	732.06	3.520
3	Mr Noodles	1	727.71	3.500
4	Topramen	1	775.54	3.720

SAUCE

Table 4: Preparation and analysis of sample-sauce

SI NO	FOOD PRODUCTS	VOLUME (ml)	CONCENTRATION (mg/ml)	ABSORBANCE (nm)
1	Soya sauce	1	705.97	3.400
2	Tomato sauce	1	699.45	3.370

MASALA POWDERS

Table 5: Preparation And Analysis of Sample-Masala Powders

SI NO	FOOD PRODUCTS	VOLUME (ml)	CONCENTRATION (mg/ml)	ABSORBANCE (nm)
1	Fish masala powder	1	636.41	3.081
2	Chicken masala powder	1	410.32	2.042

CONCLUSION-

In our studies, we purchase the different types of food products like lays,noodles,sauce and masala powder from local market of palakkad. MSG is a flavor enhancer.It is commonly added Chinese food,canned vegetables,soup and processed meats.

ACKNOWLEDGMENT

The authors sincerely thank the management of Prime College of Pharmacy.

REFERENCE

1) Hashem, H.E.; Safwat, M.D.E.; Algaidi, S. The Effect of Monosodium Glutamate on the Cerebellar Cortex of Male Albino Rats and the Protective Role of Vitamin C (Histological and Immunohistochemical Study). Journal of Molecular Histology 2012; 43(2):179–186.
2) Geha, R.S.; Beiser, A.; Ren, C.; Patterson, R.; Grammar, L.C.; Ditto, A.M.; Harris , K.E. Review of Allergic Reaction to Monosodium Glutamate and Outcome of a Multicenter Double Blind Placebo-Controlled Study. Journal of Nutrition 2001;13:1032- 1038.
3) AlnokkariA,AtaieM,Alasaf Z . Colorimetric Determination of Monosodium Glutamate in Food Samples Using L-glutamate Oxidase. Chin J Appl Environ Biol 2013,19 (6):1069-1072

4) Krishna veni N, Karthika D, Surya devi M, Rubini M.F, Vishalini, M. Analysis of Monosodium l-Glutamate in Food Products by High- Performance Thin Layer Chromatography. J Young Pharm. 2010;2(3):297-299.
5) Firstcaauliarachma, Tuniksaptawati. Analysis Tolerance of Monosodium Glutamate (MSG) In instant noodles With Uv-Vis Spectrophotometry. Journal of science and technology research. 2021;1(1): 20-24.
6) Kamal Niaz,ElizabetaZaplatic,JonathanSpoor.Extensiv use of monosodium glutamate;A threat to public health.j.EXCLI.2018;17:273-278.
7) Abdul Hamadetal.Monosodium Glutamate as a Food Additive: Toxic Implications and the Protective Role of Quercetin. Merit Res. J. Med. Med. Sci. 2017;5(8):384-402.
8) D marina. Monosodium Glutamate Analysis in Meatballs Soup. IOP Conf Serie.2018;0(335):15.
9) Hajihasani MM, Soheili V, Zirak MR, Sahebkar AH, Shakeri A. Natural products as safeguards against monosodium glutamate-induced toxicity. Iran J Basic Med Sci 2020; 23:416-430
10) Skoog, D. A, principles of instrumental analysis, 3rd edition, CBS publishing and sons,1988, 40-58.