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A SIMPLE SPECTROPHOTOMETRIC ASSAY OFALMOTRIPTA MALATE IN BUILK AND PHARMACEUTICAL FORMULATIONS

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ABSTRACT

A simple, sensitive, rapid and accurate colorimetric method has been developed for the estimation of Almotriptan malate in bulk and pharmaceutical dosage forms. The proposed method was based on the formation of chloroform extractable complex of Almotriptan malate with wool fast blue. The absorbance of the extractable ion pair complex is measured at the wavelength of maximum absorbance 585 nm against the reagent blank. The results obtained with the proposed method are in good agreement with labeled amounts, when marketed pharmaceutical preparations are analyzed. Results obtained are statistically validated and found to be reproducible.

KEYWORDS: Spectrophotometry, Wool fast blue, Almotriptan malate, Pharmaceutical and Formulation.

INTRODUCTION

Almotriptan malate (Fig.1) is a selective and potent serotonin 5-hydroxy trytamine1B/1D (5-HT 1B/1D) receptor agonist. It is chemically designated as 1[[[3-[2-(Di methyl amine) ethyl]-1H-indol-5-yl] methyl] sulfonyl] pyrrolidine±hydroxy butane dioate 1(1:1). Its empirical formula is $C_{17}H_{25}N_3O_2S.C_4H_6O_5$ representing molecular weight of 469.56. It is a white slightly yellow crystalline powder that is soluble in water and sparingly soluble in methanol. Almotriptan is available in market as conventional tablets (AXERT). The drug is absorbed well orally, with an absolute bioavailability of around 70%. The drug is used to treat severe migraine headaches and vascular headaches; acute treatment of migraine attacks with or without aura. The literature suggested and reported which includes, spectrophotometric method[1-6], Fluorimetric and Colorimetric method[7] HPLC methods[8-10], RP-HPLC[12-13] and

HPTLC[15] techniques for the quantitative estimation of almotriptan malate in bulk, formulations and in biological samples.

Spectrophotometry is the technique of choice even today in the laboratories of research, hospitals and pharmaceutical industries due to its low cost and inherent simplicity. This paper describes two rapid, simple, sensitive and economical spectrophotometeric methods for the determination of almotriptan malate in commercial dosage forms. This method based on the formation of chloroform extractable complex of almotriptan malate with wool fast blue. The ion association complex is a special form of molecular complex resulting from two components extractable into organic solvents from aqueous phase at suitable pH. One component is a chromogen (wool fast blue processing charge (Cationic or anionic in nature) & so insoluble in organic solvents. The other is colorless, processing opposite charge to that of chromogen. The main purpose of the present study was to establish relatively simple, sensitive and validated visible spectrophotometric methods for the determination of almotriptan malate in pure form and in pharmaceutical dosage forms. The reaction sequence of charge transfer complex can be shown in Scheme 1.

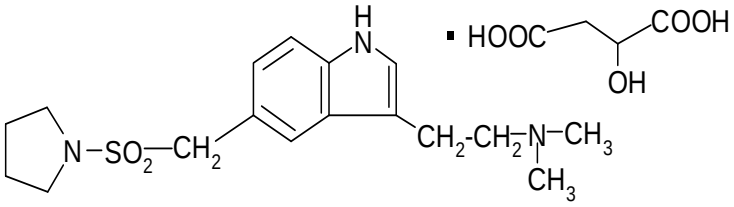


Fig.1: The chemical structure of Almotriptan malate

MATERIALS AND METHODS

Instrument

All measurement were done on Milton Roy 1001spectrophotometer by using 10 mm matched quartz cuvettes.

Materials

All chemicals used are of A.R. grade and were purchased from S.D. fine chemicals and LOBA-Chemi, Mumbai. Doubled distilled water were used for preparation of solutions

Buffer solution (p^H 1.5)

Buffer solution is prepared by mixing 289 ml of glycine solution (37.52 gm of glycine and 29.24 gm of NaCl are dissolved in 500ml of distilled water) with 711ml of 0.1 M Hcl.

Preparation of standard stock solution

The standard stock solution (1mg/ml) of almotriptan malate was prepared by dissolving 100mg of AM in 100 ml distilled water. The working standard solutions of AM were obtained by appropriately diluting the standard stock solution with the same solvent.

Preparation of Calibration curve

Aliquots of standard drug solution of almotriptan malate 0.5 – 2.5 ml were taken and transferred into a series of 100 ml of separating funnels. To each funnel 2 ml of 0.2% wool fast blue was added. Reaction mixture was shaken gently for 5 min. Then 10 ml of chloroform was added to each of them. The contents are shaken thoroughly for 5 min and allowed to stand, so as to separate the aqueous and chloroform layer. Colored chloroform layer was separated out and absorbance was measured at 585 nm against reagent blank. The calibration graph was constructed by plotting the drug concentration versus absorbance (Fig.2). The amount of drug was computed from its calibration graph. (fig 2).

Assay of pharmaceutical Formulations

About 20 tablets were weighed to get the average tablet weight and pulverized. The powder equivalent to 100mg of almotriptan malate was weighed, dispersed in 25ml of Isopropyl alcohol, sonicated for 15 minutes and filtered through Whatman filter paper No 41.The filtrate was evaporated to dryness and the residue was dissolved as under standard solution preparation.

Validation

Accuracy of the proposed methods was carried as on the basis of recovery studies. It is performed by the standard addition method. Recovery studies were performed by adding standard drug at different levels to the pre-analyzed tablets powder and the proposed method was followed. From the amount of the drug estimated, the percentage recovery was calculated. The results of the analysis are shown in table 2.

RESULTS AND DISCUSSION

Almotriptan malate was treated with wool fast blue dye at 3.5 pH. The resultant solution is extracted with chloroform. The ion pair complex is formed in extractable chloroform layer. The absorbance of the extractable ion pair complex is measured at 585 nm against the reagent blank. The calibration curve was linear over the range of 50-250 µg/mL of almotriptan malate. The proposed method was validated statistically and by recovery studies. The molar

absorptivity and Sandell's sensitivity values show the sensitivity of method. Assay results of recovery studies are given in table 2. Results are in good agreement with labeled value. The reproducibility, repeatability and accuracy of this method were found to be good, which is evidenced by low standard deviation.

The regression analysis using method of least squares was made for the slope (b), intercept (a) and correlation (r) obtained from different concentrations and results are summarized in table 1. The optical characteristics such as absorption maxima, Beer's law limits, molar absorptivity, Sandell's sensitivity and percent relative standard deviation were calculated and the results are summarized in Table 1. The optimum conditions for color development have been established by varying the parameters one at a time and keeping the other parameters fixed and observing the effect of product on the absorbance of the colored species. These studies revealed that the common excipients and other additives such as starch, talc, lactose and magnesium stearate, that are usually present in tablet dosage forms, did not interfere at their regularly added levels orated in the procedure.

Table 1: Optical Characteristics of The Proposed Method.

parameters	Proposed method
Wavelength (nm)	585
Beer's limits, mcg/ml	50-250
Sandell's , sensitivity, (µg cm^{-2})	0.1427
Molar absorptivity, (L mol^{-1} cm^{-1})	$1.26x10^{2}$
Regression equation, Y*	Y= 0.0025x+0.0063
Correlation coefficient, (r)	0.9999
Intercept (a)	00025
Slope (b)	0.0063

Table 2: Assay and Recovery of Almotriptan Malate In Tablet Formulations.

Formulation	Labeled amount	*Amount found (mg±S.D)	% Recovery	*t value
Tablet 1	12.5	12.74±0.41	99.98	1.290
Tablet 2	12.5	12.68±0.0.48	100.2	0.8630
Tablet 3	12.5	12.58±0.37	100.05	0.4833

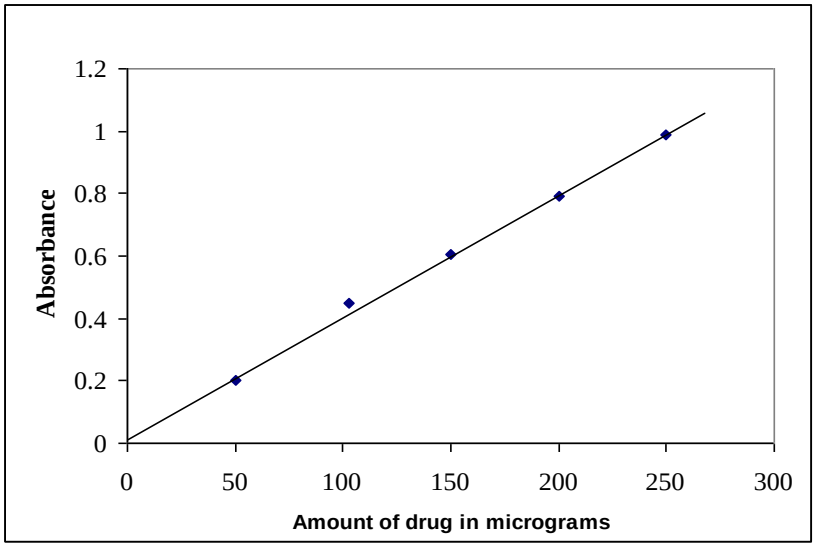
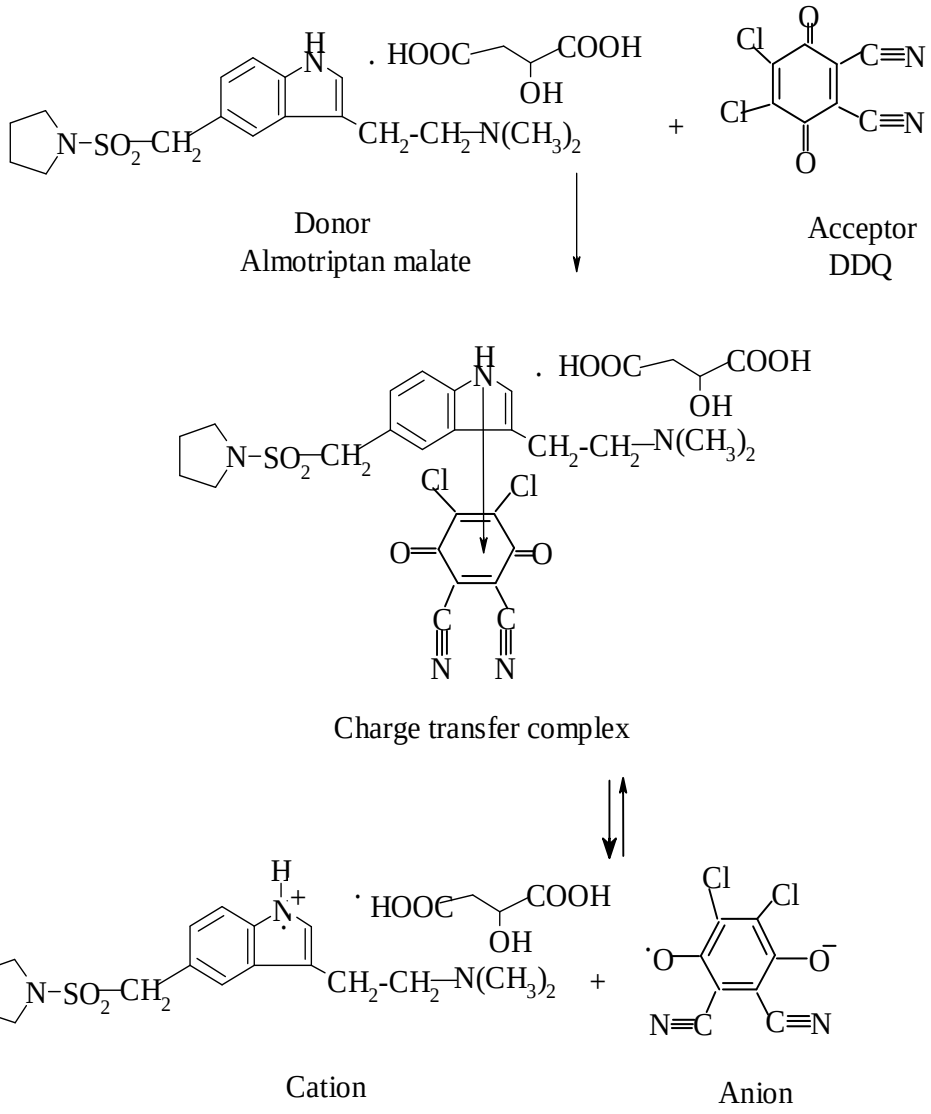


Fig.2: Calibration curve of almotriptan malate



Scheme.1: The reaction sequence of charge transfer complex.

CONCLUSION

The developed visible spectrophotometric method was simple, sensitive, accurate, precise, and reproducible and can be successfully applied for the routine estimation of almotriptan malate in bulk and pharmaceutical dosage forms.

REFERENCES

1. Viplava prasad U, Syam babu, kalyana ramu, Visible spectrophotometric analysis of almotriptan malate bulk and formulations. International journal of scientific and technology research, 2011; 1(5): 86-9.
2. Viplava Prasad U, Syam Bab M, Kalyana Ramu B. Development Of New Visible Spectrophotometric Methods For Quantitative Determination Of Almotriptan Malate As An Active Pharmaceutical Ingredient In Formulations. Int. J. Drug Dev. & Res, 2012; 4(2): 369-374.
3. Suneetha A, Syamsundar B. New simple UV spectrophotometric method for estimation of almotriptan malate in bulk and pharmaceutical dosage form. Asian journal of Research in Chemistry, 2010; 3(1): 142-145.
4. Suneetha A, Ravi teja R, Kathirvel S, Spectrophotometric estimation of almotriptan malate in bulk and pharmaceuitical formulations by BY Multivariate Technique, International journal of medical chemistry and analysis, 2012; 2(2):76-80.
5. Viplava Prasad U, Syam Bab M, Kalyana Ramu B. Development of New Visible Spectrophotometric Methods for Quantitative Determination of Almotriptan Malate Using Quinones as Chromogenic Reagents Chem Sci Trans., 2012; 1(2): 297-302.
6. Viplava Prasad U, Syam Bab M, Kalyana Ramu B. Quantitative assay of almotriptan malate in pure drugand pharmaceutical preparations using simple and convenient visible spectrophotometric method. International journal of pharma sciences and research, 2012; 3(5): 379-386.
7. EI-Bagary Ramzia I, Mohammed NG, Nasr HA. Fluorimetric and colorimetric methods for the determination of some anti-migraine drugs. Journal of Chemical and Pharmaceutical Research., 2011; 3(4): 304-31.
8. Petikam LavuduAvula Prameela RaniChandra Bala Sekaran. Development And Validation of HPLC Method for The Determination Of Almotriptan Malate in Bulk and Tablet Dosage Forms. International Journal of PharmTech Research, 2013; 5(2): 459-466.

9. Ravikumar K, Balasekhara Reddy C, Babu Rao C. Chandrasekhar KB. Method development and validation of almotriptan in human plasma by HPLC tandem mass spectrometry: Application to a pharmacokinetic study. Sci. Pharm., 2010; 80: 367-378.
10. Petikam Lavudu, Avula Prameela Rani, Chepuri Divya, Chandra Bala Sekharan. High Performance Liquid Chromatographic Analysis of Almotriptan Malate in Bulk and Tablets. Adv Pharm Bull., 2013; 3(1): 183–188.
11. Suneetha A, Syamsundar B. A validated RP-HPLC method for estimation of almotriptan malatein pharmaceutical dosage form. Journal of the Chinese Chemical society, 2010; 57(5A): 1067-1070.
12. Kumar AP, Ganesh VRL, Subba Rao DV, Anil B, Venu gopal rao B, Hari Krishna VS. A validated RP-HPLC method for determination of process related impurities in almotriptan malate API. Journal of Pharmaceutical & Biomedical Analysis, 2008; 46(4): 792-798.
13. Suneetha A, Syama Sundar B.A validated RP- HPLC method for estimation of almotriptan malate in pharmaceutical dosage form. J. Chinese Chem. Soc., 2010; 57: 1067-1070.
14. Phani kumar V. Sunandamma Y. New RP - HPLC method development and validation for analysis of almotriptan, Int. J. Res. Pharm. Chem., 2011; 1: 542-545.
15. Suneetha A, Syamsundar B. Development and validation of HPTLC method for the estimation of almotriptan malate in tablet dosage form. Indian Journal of Pharmaceutical Sciences., 2010; 72(5): 629-32.