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Research Article

QUANTIFICATION OF METADOXINE IN PHARMACEUTICAL DOSAGE FORMS BY UV-SPECTROPHOTOMETRY

P.L.K.M. Rao, V. Venugopal, B. Arun prasath, T. Mahati*, R. Himaja, T. Kavitha and K. Esther rani

Department of Pharmaceutical Analysis, SLC's college of Pharmacy, Hyderabad, Andhra Pradesh, India.

*Corresponding Author: mahati10@gmail.com

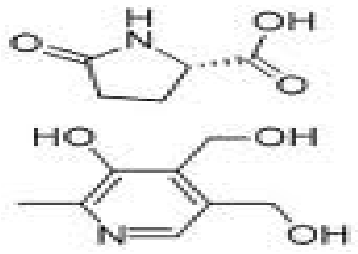
ABSTRACT

A simple and precise standard second derivative UV-spectrophotometric method was developed for the estimation of metadoxine in pharmaceutical dosage form. The λmax of metadoxine was found to be 291nm. The second derivative spectrum shows well resolved through excipients. Beer's law is obeyed in the concentration 8-64 mcg/ml. The proposed methods are sensitive, accurate, reproducible and useful for routine determination of metadoxine in pharmaceutical dosage forms. The method was validated statistically and by recovery studies. The LOD and LOQ for second derivative spectra were found to be 2.3735 mcg/ml and 7.131 mcg/ml.

Keywords: Metadoxine, Methanol,UV- spectrophotometer.

INTRODUCTION

Metadoxine (5-hydroxy-6-methylpyridine-3, 4-dimethanol) in (1:1) (or) L-Proline, 5-Oxo-1.3, compound with 5–hydroxy-6-methylpyridine-3, 4-dimethanol in (1:1)) is used in acute and chronic alcoholism[1-8]. Literature review revealed different analytical methods such as HPTLC[9] and HPLC[10] for the quantitative determination of metadoxine and its metabolites. The present work deals with estimation of metadoxine in tablets by standard absorbance method and second derivative UV-spectrophotometric method. The main objective of the work was to develop simple, fast, inexpensive, sensitive and accurate method.



EXPERIMENTAL

METHOD 1: UV- SPECTROSCOPY

Instrument

An Analytical technologies limited AUV 2092 spectrophotometer with a band width of 2nm, wavelength accuracy of ±0.5%T and matched quartz cells were used.

Chemicals

Metadoxine, Methanol, Double distilled water.

Preparation of standard stock solution

A standard stock solution of the pure analyte was prepared dissolving 50mg of the analyte in 50 ml of methanol. This stock solution was used to prepare for further standard solutions of drug.

ESTABLISHMENT OF OPTIMAL LEVEL OF VARIOUS PARAMETERS

Absorption maximum

Standard stock solution of analyte was suitably diluted to yield varying concentration of 8-64mcg/ml. The absorbance was measured at about 200-350nm, and was plotted against concentration. The analytical curve was constructed by plotting concentration versus

absorbance. The beer's concentration range was found to be 8-64mcg/ml.

Market Sample Analysis

Ten tablets were weighed and powdered. A quantity equivalent to 12.5mg of metadoxine was weighed accurately, transferred to a beaker, dissolved in solvent, filtered through whatmann filter paper No.1 and made up to volume with solvent. Appropriate aliquots were subjected to above methods and the amount of metadoxine was determined from the calibration curve.

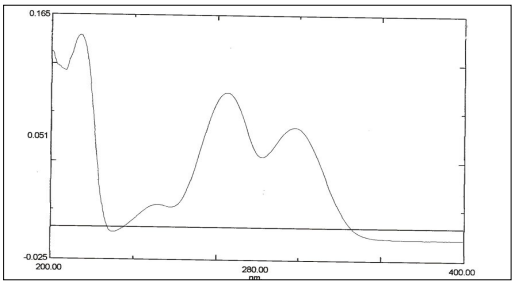
Recovery studies

To study the accuracy and reproducibility of the proposed methods, recovery experiments were carried out by adding a known amount of drug to preanalysed sample and the percentage recovery was calculated.

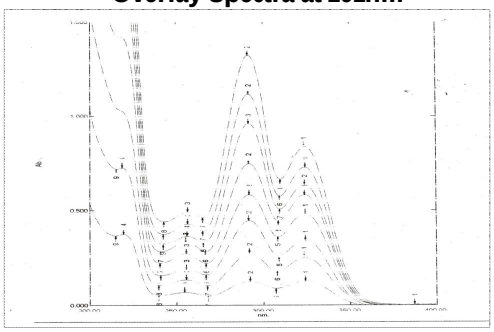
RESULT AND DISCUSSION

The two simple methods inclusive of simple UV-Spectroscopy and second derivative spectrophotometric methods were developed for the estimation of metadoxine in pharmaceutical dosage forms. The λmax of metadoxine was found to be 291nm. Linearity was found to be 8-64mcg/ml. Correlation coefficient (0.9987) indicate good linearity between concentration and slope area. The amplitude of the respective derivative spectrum is converted in terms of absorbance. Beer's law was obeyed by the fundamental spectrum. Both the methods were found to be simple, accurate, and economical for the routine analysis of metadoxine and its dosage forms. Recovery studies were found to be close to 99% that indicated the accuracy and precision of the above two proposed methods.

λ_{max} of Metadoxine



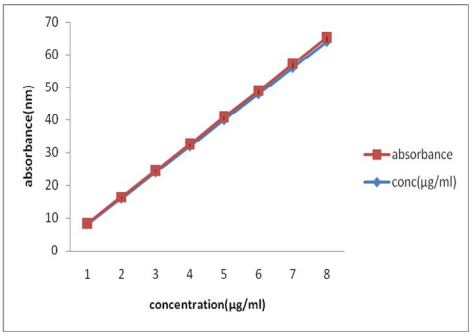
Overlay Spectra at 291nm



Absorbance at 291nm

S. No.	Concentration (µg/ml)	Absorbance (nm)
1	8	0.171
2	16	0.307
3	24	0.455
4	32	0.658
5	40	0.866
6	48	1.031
7	56	1.241
8	64	1.448

Linearity Graph of Metadoxine



Analysis of Metadoxine Tablets

Drug	Label claim (mg)	Amount found (tab) (mg)	%label claim (%)	%deviation	S.D	C.V
METADOXINE	500	500.41 501.05 500.20	100.08 100.21 100.04	(+)0.08 (+)0.21 (+)0.04	1.0612	0.0052

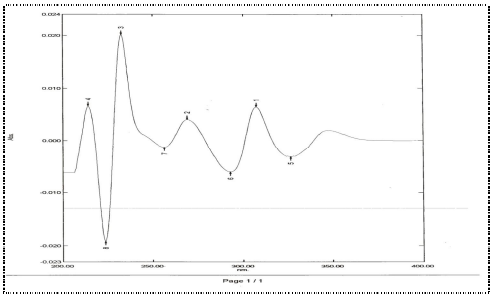
Recovery Studies

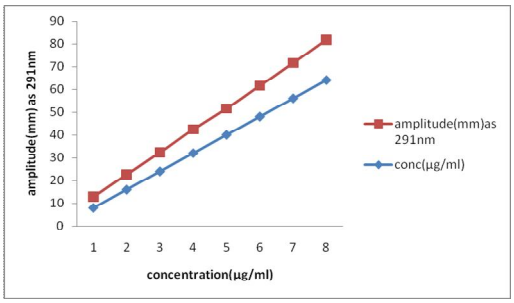
Sample	Amt. Of drug added (in mg)	Amt. Of drug recovered (in mg)	%recovered
1	20	19.95	99.75
2	10	9.98	99.80
3	10	10.05	100.05

Analysis of Metadoxine Tablets

Drug	Label claim (mg)	Amount found (tab) (mg)	%label claim (%)	%deviation	S.D	C.V
METADOXINE	500	500.41 501.05 500.20	100.08 100.21 100.04	(+)0.08 (+)0.21 (+)0.04	1.0612	0.0052

Second Derivative Spectrum of Metadoxine





Linearity Graph of Metadoxine

Conc (µg/mL)	Amplitude(mm) at 291nm
8	4.8
16	6.6
24	8.3
32	10.4
40	11.6
48	13.6
56	15.6
64	17.8

Recovery Studies

Sample	Amt. Of drug added (in mg)	Amt. Of drug recovered (in mg)	%recovered
1	20	19.95	99.75
2	10	9.98	99.80
3	10	10.05	100.05

CONCLUSION

The second derivative spectroscopic method of analysis though expensive, can also be used in the routine analysis of metadoxine in formulations, because multiple samples can be analysed simultaneously. The results obtained by these methods including recovery studies were comparable which proves the repeatability and suitability of the method

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