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NOTE

Spectrophotometric Determination of Zolmitriptan in Pharmaceutical Dosage Forms

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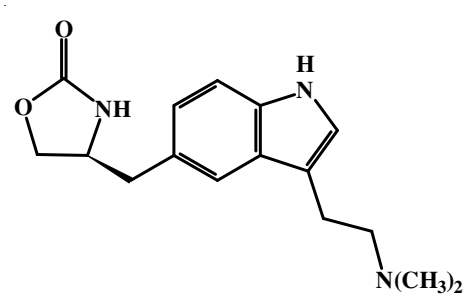
A new UV spectrophotometric method has been developed for the quantitative estimation of zolmitriptan in pure form as well as in pharmaceutical formulations. The drug exhibits absorption maximum at 226 nm in methanol and obeys Beer's law in the concentration range of 1-6 µg/mL. The method was extended to pharmaceutical preparations and there is no interference from any common pharmaceutical additives.

Key Words: UV-Spectrophotometric, Zolmitriptan.

Zolmitriptan[1] is chemically (S)-4-[[3-[2-(dimethylamino)ethyl]-1*H*-indol-5-yl]methyl]-2-oxazolidinone. It is used for acute treatment of migraine[2,3] attacks. Literature survey reveals that, few chromatographic[4-6] methods have been reported for the estimation of zolmitriptan. No UV method was reported in literature for analysis of zolmitriptan. Hence, the authors have made an attempt to develop a rapid and sensitive UV spectrophotometric method for estimation of zolmitriptan in bulk drugs and pharmaceutical formulations.



Structure of zolmitriptan

All spectral and absorbance measurements were made on a Shimazdu model 1601 digital spectrophotometer with 10 mm matched quartz cells.

Preparation of standard and sample solutions: Accurately weighed 25 mg of zolmitriptan was dissolved and diluted with methanol stepwise so as to obtain a concentration of 10 µg/mL.

Tablet powder equivalent to 25 mg of zolmitriptan was accurately weighed and sample solution prepared as per the standard solution.

Assay procedure: Into a series of 10 mL volumetric flasks aliquots of working standard solution (10 µg/mL) ranging from 1-6 mL were added and the volume was made up to 10 mL with methanol. The absorbance were measured at 226 nm against solvent blank. The amount of zolmitriptan present in the sample solution was computed from the calibration curve.

The optical characteristics such as Beer's law limits, sandell's sensitivity, molar absorptivity, per cent relative standard deviation (calculated from eight replicate samples containing 3/4th of the amount of the upper beer's law limits) were calculated and the results are summarized in Table-1. Regression characteristics like slope, intercept and % range of error (0.05 and 0.01 confidence limits) were calculated and shown in Table-1.

TABLE-1
OPTICAL AND REGRESSION CHARACTERISTICS, PRECISION AND ACCURACY OF THE PROPOSED METHOD FOR ZOLMITRIPTAN

Parameter	Zolmitriptan
λ_{max} (nm)	226
Beer's law limits (µg/mL)	1-6
Molar absorptivity (L mol^{-1} cm^{-1})	37.3×10^5
Sandell's sensitivity	0.00076
Regression equation (Y = a + bC)	
Slope (b)	0.12830
Intercept (a)	0.00160
Correlation coefficient (r)	0.99940
Relative standard deviation (%)*	0.41117
% Range of error (confidence limits)*	
0.05 level	0.34380
0.01 level	0.50865

*Average of eight determinations.
In Y = a + bC, Y is absorbance and C is concentration.

Application of proposed method for the determination of zolmitriptan in its dosage forms was successfully made. The results are presented in Table-2. The excellent recoveries obtained indicated the absence of any interference from the excipients.

TABLE-2
RESULTS OF ANALYSIS OF TABLET FORMULATIONS CONTAINING ZOLMITRIPTAN

Formulation	Labeled amount (mg)	Amount obtained (mg)	Recovery obtained* (%)
Tablets-1	5.0	4.976	99.53
Tablets-2	5.0	4.953	99.06
Tablets-3	2.5	2.480	99.20
Tablets-4	2.5	2.493	99.73

*Average of three determinations.

Conclusion

The proposed method was found to be simple, economical and sensitive. The statistical parameters and recovery study data clearly indicate the reproducibility and accuracy of the method. Analysis of authentic samples containing zolmitriptan showed no interference from common excipients. Hence, this method could be considered for the determination of zolmitriptan in quality control laboratories.

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