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UV SPECTROSCOPIC METHOD FOR ESTIMATION OF 2-(2-ACETOXY BENZAMIDO)-3-(ALLYLTHIO) PROPANOATE SODIUM

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ABSTRACT
Simple, sensitive and cost effective UV-spectrophotometric method was developed for the estimation of 2-(2-acetoxybenzamido)-3-(allylthio)propanoate sodium pure and prepared pharmaceutical formulation. 2-(2-acetoxybenzamido)-3-(allylthio)propanoate sodium was estimated at 316nm in dichloromethane. Linearity range was found to be 10–50ng/mL. Y= mx+c, R^2 = 0.998. The apparent molar absorptivity was found to be 6,022 × 10^3 L mol^{-1} cm^{-1}. In the proposed method Sandell's sensitivity was found to be about 1.955 × 10^{-5}ng cm^{-2}/0.001. The LOD and LOQ were found to be 0.59078 and 1.79024ng/mL respectively. The developed method was validated respect to linearity, precision and accuracy.

KEYWORDS: UV Spectrophotometry, 2-(2-acetoxybenzamido)-3-(allylthio)propanoate sodium, Sandell's sensitivity, molar absorptivity, formulation analysis.

INTRODUCTION
2-(2-acetoxybenzamido)-3-(allylthio)propanoate sodium is a novel NMDA receptor antagonist indicated for neurodegenerative disorders.[1,2] UV estimation is a simple cost effective method for the analysis of pharmaceutical drugs in pure and its pharmaceutical formulation.[3] So the UV estimation method was applied to estimate the drug in prepared suspension formulation. There is no any analytical method is reported. The present study describes a simple, sensitive, accurate and precise spectrophotometric method for estimation of 2-(2-acetoxybenzamido)-3-(allylthio) propanoate sodium pure and prepared formulation.[4] Developed method is validated as per ICH guideline.[5]

MATERIAL AND METHODS
Instrument Used
Apparatus
The spectrophotometric measurements were carried out using a T60 UV/Visible double beam spectrophotometer with 1 cm matched quartz cells.

Reagents
Dichloromethane of analytical grade was used. Suspension of 2-(2-acetoxybenzamido)-3-(allylthio)propanoate sodium was formulated and evaluated as per British Pharmacopoeia.[6]

Standard solution of the drug
A stock standard solution of 1000 ng mL^{-1} was prepared by dissolving 2-(2-acetoxybenzamido)-3-(allylthio) propanoate sodium in dichloromethane. Working standard solution was then prepared by suitable dilution of the standard stock solution with dichloromethane.

Determination of λmax
The working standard solution was subjected to scanning between 200 to 400 nm and absorption maximum was determined (Fig. 1). The λ max of 2-(2-acetoxybenzamido)-3-(allylthio)propanoate sodium was found as 316 nm and that was selected for the analysis. The calibration curve was prepared in the concentration range of 10-50ng mL^{-1} at 316 nm. By using the calibration curve, the concentration of the sample solution can be determined.

Linearity and Calibration
The aliquots working standard solution was diluted serially with sufficient dichloromethane to obtain the concentration range of 10 – 50ng mL^{-1}. A calibration curve for 2-(2-acetoxybenzamido)-3-(allylthio)propanoate sodium was obtained by measuring the absorbance at the λmax of 316 nm. Statistical parameters like the slope, intercept, coefficient of correlation, standard deviation and relative standard deviation were determined using Graph-Pad Prism 5 (San Diego, California) software.

Procedure for formulations

The pooled volume of suspension of 2-(2-acetoxybenzamido)-3-(allylthio)propanoate sodium was mixed thoroughly and 1mL (25mg/mL) of 2-(2-acetoxybenzamido)-3-(allylthio)propanoate sodium was dissolved in a 25 mL of dichloromethane and shaken well for about 5 minutes and filtered through a Whatman filter paper No.40. Convenient aliquots from this solution were taken for the determination of 2-(2-acetoxybenzamido)-3-(allylthio)propanoate sodium in the range 10 to 50 ng mL^{-1}.

Recovery studies

Recovery studies were performed to judge the accuracy of the method. Recovery studies were carried out by adding a known quantity of pure drug to a pre-analyzed formulation and the proposed method was followed. From the amount of drug found, percentage recovery was calculated. The results of analysis and recovery studies are given in Table 3.

RESULTS AND DISCUSSION

The UV scan of standard solution between 200 to 400 nm showed the absorption maxima at 316 nm, shown in fig. 1. The optical characteristics such as Beer's law limits, Sandell's sensitivity, molar absorptivity and the results are summarized in Table 1. The assay and precision studies results for suspension containing 2-(2-acetoxybenzamido)-3-(allylthio) propanoate sodium are shown in Table 2. The recovery studies for the formulation were studied and are shown in Table 3. The excellent recovery studies prove the accuracy of the method.

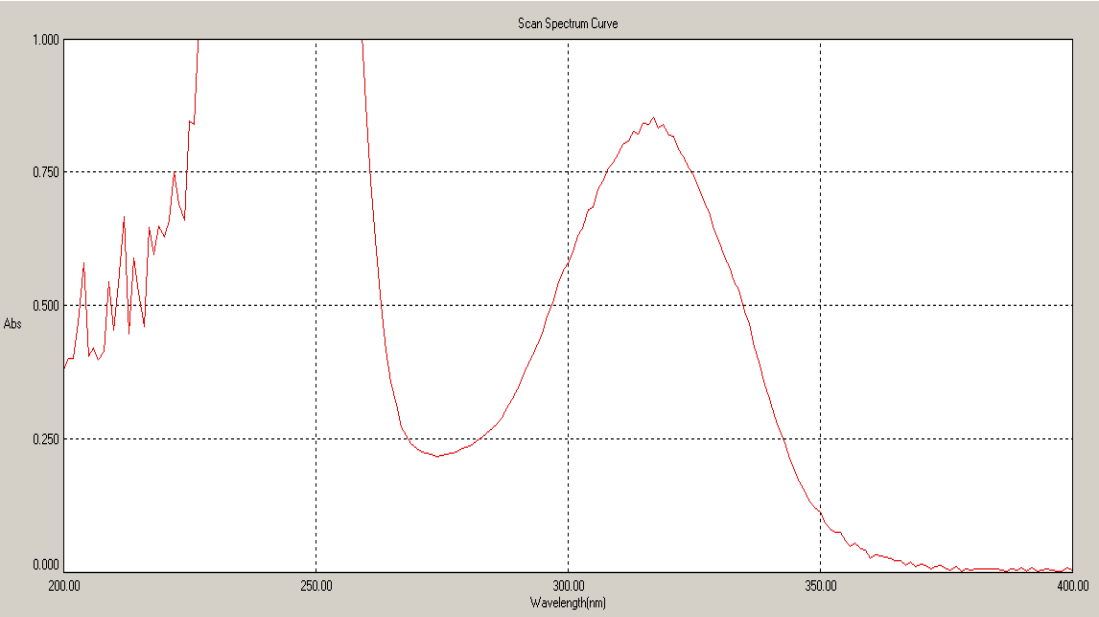

Fig. 1: UV spectrum of 2-(2-acetoxybenzamido)-3-(allylthio)propanoate sodium in dichloromethane.

Table 1. Optical characteristics of proposed method.

Parameters	Values
λ_{max} (nm)	316
Beer's law limit (ng mL^{-1})	10-50
Sandell's sensitivity (ng cm^{-2}/0.001 absorbance unit)	1.955×10^{-5}
Molar absorptivity (L mol^{-1} cm^{-1})	$6{,}022 \times 10^{3}$
Regression equation (Y = mx + c) Slope (m) Intercept (c)	 0.01812 0.01434
Correlation coefficient (R^2)	0.998

Table 2: Assay results and precision studies.

Formulation	Labeled amount (mg/ mL)	(%) label claim ± S.D (n=6)	Precision (n=6)	
			Inter-day	Intra-day
2-(2-acetoxy benzamido)-3-(allylthio)propanoate sodium Suspension	25	99.23 ± 0.2547	0.3948	0.394

Table 3: Recovery study.

Formulation	Label Claim (mg/ mL)	(%) label claim* ± S.D	Amount of drug added (ng)	Amount of drug recovered (ng)	Percentage recovery* ± SD
2-(2-acetoxy benzamido)-3-(allylthio)propanoate sodium Suspension	25	99.23 ± 0.2547	10.0	09.62	98.733±0.43461
			20.0	20.4	101.01±0.23292
			30.0	29.84	99.68±0.55857

*n=6.

CONCLUSION

The proposed method was successfully applied for the determination of 2-(2-acetoxybenzamido)-3-(allylthio) propanoate sodium in prepared pharmaceutical formulation. The results demonstrated that the procedure is accurate, precise and reproducible. This method can be applied for the estimation of 2-(2-acetoxybenzamido)-3-(allylthio)propanoate sodium in its dosage forms.

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