

Spectrophotometric Determination of Cefadroxil in Dosage Forms

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Accepted 11 February 2004

Revised 21 November 2003

Received 23 May 2003

A simple and sensitive spectrophotometric method for the determination of cefadroxil anhydrous and its dosage forms is described. The method is based on the reaction of the drug with Folin-Ciocalteu reagent in presence of sodium hydroxide and stannous chloride to form a blue coloured chromogen having λ_{\max} at 970 nm. The absorbance was found to be linear with the concentration in the range of 5-25 $\mu\text{g}/10$ ml. The colour developed was stable up to 5 h.

Anhydrous cefadroxil [7 {(R)-2-amino-2-(4-hydroxy phenyl) acetamido}3-methyl-3-cephem-4-carboxylic acid] is a broad-spectrum antibiotic^{1,2}. The IP method of estimation is by HPLC¹. Hence in the present study a simple, rapid, sensitive and reproducible spectrophotometric method was developed. Anhydrous cefadroxil shows absorption maximum at 970 nm with Folin-Ciocalteu (FC) reagent³ and obeys Beer's law in the range 5 to 25 $\mu\text{g}/10$ ml.

Sodium hydroxide, stannous chloride, sodium tungstate, sodium molybdate, phosphoric acid, hydrochloric acid, lithium sulfate and other chemicals used were of analytical grade purchased from S. D. Fine Chemicals, Mumbai. Anhydrous cefadroxil was a gift sample from Arvind Pharma Pvt. Ltd., Chennai.

Aliquots ranging from 0.05 ml to 0.20 ml of the working standard drug solution (100 $\mu\text{g}/\text{ml}$) were pipetted into a series of 10 ml volumetric flasks. 1.0 ml of portions of FC reagent solution³, 2 ml of 2 M sodium hydroxide solution and 0.8 ml of 1% stannous chloride⁴ were added into each flask and kept aside for 2 min for colour development. Then the volumes were made up to the mark with distilled water. The absorbance of the solutions was measured at 970 nm against reagent as blank. The optical characteristics and precision values of the method are presented in Table 1.

For preparation of the solution of the drug in the tablets and capsules, the following procedure was adopted. Ten tablets or capsules of cefadroxil (each containing 500 mg of

anhydrous cefadroxil) were accurately weighed and powdered. The powder equivalent to 100 mg of the drug was taken in small quantity of distilled water and thoroughly shaken for 15 min. It was then filtered through a Whatman filter paper into 100 ml volumetric flask and the volume was made up with distilled water. The reagents were added as described earlier. The absorbance of the solutions was measured at 970 nm against reagent as blank. The values obtained for the estimation of anhydrous cefadroxil in pharmaceutical formulations (tablets and capsules) from different

TABLE 1: OPTICAL CHARACTERISTICS AND PRECISION DATA

Parameter	Observation
λ_{\max}	970 nm
Beer's law limit ($\mu\text{g}/10$ ml)	5-25
Operating temperature	37°
pH of the medium (approximate)	13.2
Stability of the colour	Stable up to 5 h
Molar extinction coefficient	2.73×10^4
Sandell's sensitivity	0.277
Standard deviation	0.547
Standard error	0.315
Percentage error	0.150

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TABLE 2: COMPARISON OF THE PROPOSED METHOD WITH THE REPORTED METHOD

Dosage form	Label Claim (mg)	Percentage recovery	
		Proposed	Reported*
TABLET			
a) Cefcare (Aristo)	500	109.6	107.9
b) Cefudur (Protec)	500	107.4	106.2
CAPSULE			
a) Modcef(Sarabai)	500	103.4	102.9
b) Bidcaps(Kopran)	500	101.5	101.7

*IP 1996 standards 90-120% w/w.

companies by the proposed and reported methods were compared in Table 2.

To evaluate the validity and reproducibility of the method, known amount of pure drug was added to the previously analyzed pharmaceutical formulations and the mixture was analyzed by the proposed method and the recoveries (average of six determination) were given in Table 2. Interference studies revealed the excipients commonly present in the dosage forms did not interfere in the proposed method.

ACKNOWLEDGEMENTS

The authors are thankful to Principal of C. L. Baid Metha

College of Pharmacy Chennai, for providing the facilities to carry out the work and Prof. B. G. Desai, Principal, K. L. E. Society's College of Pharmacy, Rajajinagar, Bangalore for his constant support.

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Assay of Lamotrigine and Nicorandil by Difference Spectroscopy

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Accepted 11 February 2004

Revised 22 November 2003

Received 31 December 2002

Two analytical methods for the estimation of lamotrigine and nicorandil in bulk drug and in their tablet formulations are described. These methods are based upon difference spectroscopy and are quite, simple, rapid, sensitive and selective. The Beer's law range was followed in the concentration range of 5-35 µg/ml and 10-40 µg/ml. The molar absorptivities were 9.731×10^3 l/mol.cm and 2.407×10^3 l/mol.cm for lamotrigine and nicorandil respectively.

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