Asian Journal of Chemistry Vol. 19, No. 4 (2007), 3277-3279

NOTE

UV Spectrophotometric Determination of Cefpodoxime Proxetil in Pure and Pharmaceutical Formulation

C.S. CHAUHAN*, M.S. RANAWAT† and P.K. CHOUDHURY‡
Department of Pharmaceutical Chemistry, B.N.College of Pharmacy
Udaipur-313 001, India

Simple and sensitive method has been developed for determination of cefpodoxime proxetil in both pure and pharmaceutical formulation. This method obeys Beer's law in the concentration range of 10 to 70 µg/mL, exhibiting maximum absorption at 260.8 nm. In this method, no interference from the common pharmaceutical excipients was observed.

Key Words: UV spectrophotometric, Cefpodoxime proxetil.

Cefpodoxime is a semi synthetic cephalosporin. The drug is commercially available as cefpodoxime proxetil. Cefpodoxime proxetil (CP) is an extended spectrum third generation oral cephalosporin. Cefpodoxime proxetil is a prodrug, which is de-esterified in intestine to its active metabolite cefpodoxime[1]. Chemically, cefpodoxime proxetil is {(RS)-1 (isopropoxycarbonyloxy)ethyl(+)-(6R,7R)-7-[2-(2-amino-4-thiazolyl)-2-{(Z)methoxyimino}acetamido]-3-methoxymethyl-8-oxo-5-thia-1-azabicyclo[4.2.0]oct-2-ene-2-carboxylate}[2]. The empirical formula is $C_{21}H_{27}N_5O_9S_2$ and its molecular weight is 557.59. A few HPLC methods[3] have been reported for cefpodoxime proxetil. Literature survey revealed that no visible and UV methods have been reported for estimation of CP. An attempt have been made to develop an accurate and reliable UV spectrophotometric method for estimation of CP in pure as well as in pharmaceutical dosage forms.

All the chemicals used were of analytical grade. A Shimadzu UV-250 1PC double beam spectrometer was used for all absorbance measurement. The solubility study conducted reveled that CP has appreciable solubility in NaH_2PO_4 buffer pH 6.7 and 0.1 N methanolic hydrochloride.

†Sanjeevan College of Pharmacy, Dausa-303 301, India.
‡Department of Pharmacy, Mohanlal Sukhadia University, Udaipur-313 001, India.

The stock solution of CP was made in 0.1 N methanolic hydrochloride. 100 mg of CP was accurately weighed and dissolved in 100 mL of 0.1 N methanolic hydrochloride. The stock solution was further diluted with NaH_2PO_4 buffer pH 6.7, to obtain a working standard of 100 µg/mL. All further dilutions ranging from 10 to 70 µg/mL were made by dilution with NaH_2PO_2 buffer pH 6.7. Aliquots of solution ranging from 1 to 7 mL were transferred into series of volumetric flask and the volume was made up to 10 mL with NaH_2PO_4 buffer pH 6.7. The individual samples were scanned from 200 to 300 nm, the maximum absorbance was observed at 260.8 nm.

Thus the absorbance was measured 260.8 nm against a blank reagent. The Beer's law limits, Sandell's sensitivity, molar extinction coefficient, per cent relative standard deviation, regression equation, correlation coefficient were calculated and are shown in Table-1.

TABLE-1
OPTICAL CHARACTERSTICS OF THE PROPOSED METHOD

Parameters		
$\lambda_{max\ (nm)}$		260.8
Beers law limit (µg/mL)		10-70
Sandell's sensitivity (µg cm^{-2}/0.001 absorbance unit)		0.0253
Molar absorptivity (L mol^{-1} cm^{-1})		1.594×10^4
Regression equation (Y = a + bc)	Slope (b)	3.43×10^{-2}
	Intercept (a)	0.1238
Correlation coefficient (r)		0.9911
Relative standard deviation (%)*		0.276

*Average of eight determinations

The results of analysis of pharmaceutical formulation of CP are presented in Table-2. An accurately weighed tablet powder of CP equivalent to 100 mg of pure drug was dissolved in 100 mL 0.1 N methanolic hydrochloride. This solution was filtered using Whatmann filter paper No.41 and further diluted with NaH_2PO_4 buffer pH 6.7 to obtain concentration of 50 µg/mL. Recovery study were carried out to establish the validity and reproducibility of the developed method. Known amount of pure drug was added to previously analyzed tablet sample and mixtures were analyzed by proposed method.

TABLE-2
ESTIMATION OF CEFPODOXIME PROXETIL IN PHARMACEUTICAL FORMULATION

Sample	Labeled amount (mg)	Amount found (mg) in proposed method	Recovery (%)
Cefpodoxime proxetil			
Tablet I	100	100.16	99.28
Tablet II	100	100.24	100.00

Thus it could be concluded that the proposed method is simple, accurate and sensitive. Recovery studies revealed that the method is reproducible. It was observed that determination of cefpodoxime proxetil was not interfered by the presence of excipients. Thus the present method could be used for determination of cefpodoxime proxetil both in bulk and pharmaceutical formulation.

REFERENCES

1. J.G. Hardman and A.W. Petri, Goodman and Gilman's The Pharmacological Basis of Therapeutics, McGraw-Hill, New York, edn. 9, p. 1092, 1094 (1996).
2. USAN List No. 298, *Clin. Pharmacol. Ther.*, **44**, 363 (1988).
3. P.A. Bombart, K.S. Catheart, B.E. Bothwell and S.K. Closson, *J. Liq. Chromatogr.*, **14**, 1729 (1991).

(*Received*: 3 March 2006; *Accepted*: 1 February 2007) AJC-5397