NOTE

UV Spectrophotometric Determination of Etoricoxib and Ezetimibe

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Simple and sensitive UV spectrophotometric methods for the determination of Etoricoxib and Ezetimibe were having absorption maximum at 235 and 230 nm, respectively and these methods are extended to pharmaceutical preparations. There is no interference from any common pharmaceutical additives and diluents. The methods have been statistically evaluated and are found to be precise and accurate.

**Key Words: Spectrophotometric determination, Etoricoxib and Ezetimibe.**

Etoricoxib (ETC)[1–2] is a non-steroidal antiinflammatory drug (NSAID) and is chemically 2,3'-bipyridine, 5-chloro-6'-methyl-3-[4-[methylsulphonyl] phenyl]-The empirical formula is $C_{16}H_{15}N_2O_2SCl$ having molecular weight 358.84. Ezetimibe (EZM)[3, 4] is a cholesterol reducing agent. Chemically it is (3R,4S)-1-(4-fluorophenyl)-3-[(3S-3-(4-fluorophenyl)-3-hydroxypropyl]-4-(4-hydroxy-phenyl)-2-azetidinone. Literature survey reveals that no visible and UV methods are reported for the estimation of ETC and EZM. The authors have developed two simple, accurate and reliable UV spectrophotometric methods for the estimation of ETC and EZM in pure as well as in pharmaceutical dosage forms.

All the chemicals used were of analytical grade. Spectral and absorbance measurements were made on Systronics UV-Visible spectrophotometer-117 with 10 mm matched quartz cells.

Preparation of standard solutions: Accurately weighed 100 mg of etoricoxib was dissolved in 100 mL of distilled water and the solutions were diluted quantitatively with distilled water to obtain a final concentration of 40 µg/mL.
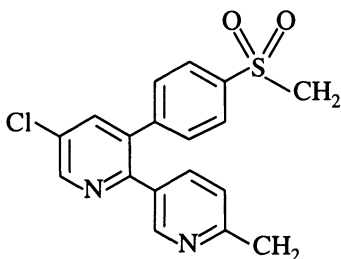
Etoricoxib
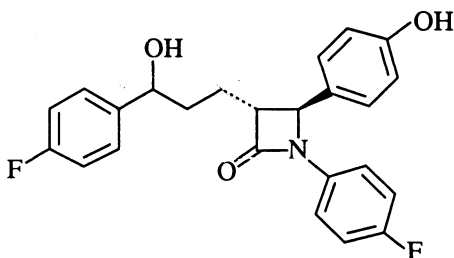
Ezetimibe
(3R,4S)-1-(4-fluorophenyl)-3-[(3S-3-
(4-fluoro-phenyl)-3-hydroxypropyl]-
4-(4-hydroxy- phenyl)-2-azetidinone

100 mg of ezetimibe drug was dissolved 10 mL of 0.1 N sodium hydroxide and then diluted stepwise with distilled water to obtain a working standard solution of 50 µg/mL.

Preparation of sample solutions: An accurately weighed amount of tablet powder of etoricoxib equivalent to 100 mg was dissolved in 100 mL of distilled water and filtered. This solution was further diluted with distilled water so as to obtain a concentration of 40 µg/mL.

Accurately weighed amount of tablet powder of EZM equivalent to 100 mg was dissolved in 10 mL of 0.1 N Sodium hydroxide, diluted to 100 mL with distilled water and filtered. This solution was further diluted with distilled water so as to obtain a concentration of 50 µg/mL.

Proposed method for ETC and EZM: Aliquots of solution 0.5 to 2.5 mL (40 µg/mL for ETC or 50 µg/mL for EZM) were transferred into a series of 10 mL volumetric flasks and the volume was brought up to 10 mL with distilled water. The absorbance was measured at 235 nm for ETC and 230 nm for EZM against a reagent blank. The amount of ETC and EZM present in the sample solution was computed from its calibration curve.

The optical characteristics such as Beer's law limits, Sandell's sensitivity, molar extinction coefficient, per cent relative standard deviation, regression equation, correlation coefficients, % range of error were calculated and the results are summarized in Table-1.

To evaluate the validity and reproducibility of the methods, known amounts of pure drug were added to previous pharmaceutical preparations and the mixtures were analyzed by the proposed methods and the results are presented in Table-2. These results indicate that the methods are simple, rapid, with reasonable precision and accuracy and applicable to various formulations of Etoricoxib and Ezetimibe.

TABLE-1

OPTICAL CHARACTERISTICS AND PRECISION OF THE PROPOSED METHODS

Parameter	Etoricoxib	Ezetimibe
λ_{max} (nm)	235	230
Beer's law limit (µg/mL)	2–10	5–25
Molar absorptivity (L mole^{-1} cm^{-1})	2.789×10^4	1.5542×10^4
Sandell's sensitivity (µg cm^{-2}/0.001 absorbance unit)	0.01286	0.03048
Regression equation (Y = a + bC):		
Slope (b)	0.0784	0.03306
Intercept (a)	-2.4×10^{-3}	-9.0×10^{-4}
Correlation coefficient (r)	0.9999	0.9999
Relative standard deviation (%)*	0.09912	0.293
% Range of error (Confidence limits)*:		
0.05 level	0.0828	0.2449
0.01 level	0.1226	0.3624

* Average of eight determinations.

TABLE-2

ESTIMATION OF ETC AND EZM IN PHARMACEUTICAL FORMULATIONS

Sample	Labelled amount (mg)	Amount found (mg) Proposed method	Recovery (%)*
Etoricoxib:			
Tablets I	60	59.99	99.98
Tablets II	60	59.97	99.95
Ezetimibe:			
Tablets I	10	10.03	100.30
Tablets II	10	9.98	99.80

*Recovery amount was the average of five determinations.

ACKNOWLEDGEMENTS

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