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SPECTROPHOTOMETRIC METHOD FOR THE ESTIMATION OF LANSOPRAZOLE IN PHARMACEUTICAL FORMULATIONS

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ABSTRACT

A simple and reproducible spectrophotometric method has been developed for the estimation of lansoprazole. This method is based on the reaction of the drug with ferric chloride and potassium ferricyanide, which forms a green chromogen exhibiting maximum absorption at 810 nm.

Key words: Lansoprazole, Spectrophotomer

INTRODUCTION

A few analytical methods[1–6] based on HPLC and spectrophotometries have been reported earlier for the determination of lansoprazole[7]. The authors now report the development of a simple and reproductive spectrophotometric method for its estimation in pure and formulation forms. Spectrophotometric parameters were established for standardization of the method by statistical analysis of the data. This method has been successfully extended to the pharmaceutical preparations containing lansoprazole.

EXPERIMENTAL

All the chemicals used were of analytical grade. Solutions of ferric chloride (0.1 M) and potassium ferricyanide (0.1%) were prepared using double distilled water. Capsules were used as sample formulations of the drug for testing the method. Spectral and absorbance measurements were made on a Systronics UV–V is spectrophotometer Model 117 with 10 mm–matched quartz cells.

About 100 mg of pure lasoprazole was accurately weighed and dissolved in 100 mL of methanol. This stock solution was further diluted with distilled water to get a working standard

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solution containing 50 µg/mL of the drug. Similarly, the stock solution of the sample was prepared by dissolving in 100 mL of methanol, a quantity of the finely ground capsule powder equivalent to 100 mg of the drug.

In the method, aliquots ranging from 0.2–1.0 mL of the working standard solution of lansoprazole along with 1.5 mL of ferric chloride solution and 2.5 mL of potassium ferricyanide solution were added to a series of 10 mL graduated test tubes and the tubes were kept aside at room temperature for 20 min. Appropriate quantity of distilled water was added to each tube to make up the volume. The absorbance of green colored complex formed was measured at 810 nm against a reagent bank. The same procedure was adopted for the sample solution also. The amount of the drug present in the sample solution was computed from the calibration curve prepared for the standard solution.

RESULTS AND DISCUSSION

The drug reduces ferric chloride to ferrous form, which in turn couples with potassium ferricyanide to give a green coloured potassium ferro–ferrous complex.

The optical characteristics such as Beer's law limits, Sandell's sensitivity, molar extinction coefficient, per cent relative standard deviation and per cent range of error were calculated for the method and the results are summarized in Table 1. The values obtained for the determination of lansoprazole in capsules by the proposed method are compared with those of a reported method[6] (Table 2). To evaluate the validity and reproducibility of the method, known amounts of pure drug were added to the previously analysed pharmaceutical preparations and the mixtures were analyzed by the proposed method. The per cent recoveries thus obtained are given in Table 2. Interference studies revealed that the common excipients and other additives usually present in the dosage forms did not contribute in the proposed method.

Table 1. Optical characteristics and precision data

Beer's law limit (µg/mL)	1.0 – 5.0
Sandell's sensitivity (µg/cm^2/0.001 absorbance unit)	0.00666
Molar extinction coefficient (1/mole.cm)	5.540×10^4
% Relative standard deviation	0.023
% Range of error	
0.05 confidence limits	± 0.028
0.01 confidence limits	± 0.019
Correlation coefficient	0.9999
Regression equation (Y*)	
Slope (a)	0.0151
Intercept (b)	0.0125

$Y^* = b + aC$, where C is concentration in µg/mL and Y is absorbance Unit.

Table 2. Assay of lansoprazole in capsules

Sample	Labeled amount (mg)	Amount obtained (mg)		Per cent recovery by the proposed method
		Reported method[5]	Proposed method	
1.	15.0	14.99	15.01	100.06
2.	30.0	29.99	30.01	100.03
3.	30.0	29.95	29.96	99.86

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