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Visible Spectorphotometric Method for the Determination of Lomefloxacin Hydrochloride in Pharmaceutical Preparations

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A new spectrophotometric method is developed for the estimation of lomefloxacin hydrochloride (LFLX) in pharmaceutical dosage forms. The method is based on the reaction of LFLX with 1 % w/v ferric nitrate solution in 1 % v/v nitric acid to form orange yellow coloured chromogen which exhibits absorption maximum at 445 nm. The formation of colored chromogen is due to the interaction of quinolone derivatives with polyvalent metal ion Fe++, to form water soluble complex[1]. The chromogen formed is stable. Beer's law is obeyed in the concentration range of 2-10 mcg/ml.

LOMEFLOXACIN[2-4] (LFLX) is a new synthetic antibacterial and it is chemically 1 - Ethyl - 6, 8 - difluoro- - 1, 4 - dihydro - 7 - (3-methyl-1-piperazinyl)- 4 - oxo -3-quinolone carboxylic acid monohydrochloride. It is widely used for the treatment of urinary tract infections and respiratory tract infections[5]. It is not official in any pharmacopoeias. Reported analytical methods include a spectrophotometric method[6], an extractive spectrophotometric method[7], a difference spectrophotometric method[8], and HPLC methods[9-15], In the present communication, the development of a visible spectrophotometric method and its application for routine analysis of LFLX in tablet formulation is described.

Analytical grade ferric nitrate was used. One % w/v solution of ferric nitrate was prepared by dissolving 1 g of ferric nitrate in 1 % v/v nitric acid in a 100 ml volumetric flask. A systronics single beam UV-VIS spectrophotometer was used for analysis.

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Stock solution of pharmaceutical grade LFLX was prepared by dissolving 50 mg LFLX in 50 ml with distilled water in a volumetric flask. Aliquots of standard solution representing 2-10 mcg/ml of LFLX were transfered into five separate 50 ml serially numbered volumetric flasks. One ml of freshly prepared 1 % w/v solution of ferric nitrate in 1 % v/v of nitric acid was added to each volumetric flask and the volume was made upto 50 ml with distilled water. The absorbance was measured at 445 nm against reagent blank.

For the analysis of tablets, 50 mg equivalent of the tablet content was transfered into a 50 ml volumetric flask and it was dissolved and made upto 50 ml with distilled water and filtered. 0.2 ml of the filtrate representing 4 mcg/ml was pipetted out into a 50 ml volumetric flask and 1 ml of 1 % w/v ferric nitrate in 1 % v/v nitric acid was added and the volume was made upto 50 ml with distilled water. Then the absorbance was measured at 445 nm against a reagent blank.

Table - 1 Analysis of Lomefloxacin Tablets

Tablets	Labelled amount (mg)	Proposed[a] method (mg)	Amount found by HPLC[16] method[b] (mg)	Recovery[c]	Percent	S.D	COV
Sample 1	400	395.00	389.2	98.51	2.316		0.6226
Sample 2	400	399.41	400.7	99.42	2.435		0.6130
Sample 3	400	392.91	394.8	98.25	2.357		0.6184

a. Each result is the mean of three replicates.

b. HPLC method: Mobile phase is the mixture of Acetonitrile : 0.05 M citric acid : 1 M Ammonium acetate (13:86:1). The liquid chromatograph is equipped with 286 nm detector and a 4.6 mm x 300 mm Octa decyl silane column. The flow rate is 1.5 ml/min.

c. Recovery of 0.5 mg, 1 mg and 1.5 mg added to pharmaceutical preparations.

LFLX reacts with 1 % w/v solution of ferric nitrate in 1 % v/v of nitric acid to form an orange yellow coloured chromogen which exhibits absorption maximum at 445 nm. The orange yellow coloured chromogen was found to be stable for more than 4 h. The stability of the formed complex was assesed by measuring the absorbance at different intervals of time, which gave constant values. Beer's law obeyed in the concentration range of 2-10 mcg/ml. (Slope = 0.015, Intercept = 0.0002, r value = 0.9997, molar absorptivity = 6.27425 x 10^3 mol^{-1} cm^{-1}). The percent recovery ranged from 98.25 to 99.51 which is indicative of non interference of excipients in the determination of the drug. The proposed method is quite simple, fast and economical so that it can be conveniently used for routine analytical work.

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