

Simultaneous Estimation of Ciprofloxacin Hydrochloride, Ofloxacin, Tinidazole and Ornidazole by Reverse Phase – High Performance Liquid Chromatography

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Abstract

A new, simple, rapid, selective, precise and accurate isocratic reverse phase high performance liquid chromatography assay has been developed for simultaneous estimation of Ciprofloxacin Hydrochloride, Ofloxacin, Tinidazole and Ornidazole in tablet formulations. The separation was achieved by using C-18 column (Phenomenax, 250 x 4.6mm i.d.) coupled with a guard column of same material, in mobile phase Acetonitrile: Water: Tri ethylamine (25:75). The pH of mobile phase was adjusted to 6.0 ± 0.1 with 50% ortho phosphoric acid. The flow rate was $1.0 \text{ mL} \cdot \text{min}^{-1}$ and the separated drugs were detected using UV detector at the wavelength of 300 nm. The retention time of Ciprofloxacin Hydrochloride, Ofloxacin, Tinidazole, and Ornidazole was noted to be 2.7, 3.5, 4.5 and 5.8 min, respectively, indicative of rather shorter analysis time. The method was validated as per ICH guidelines. The proposed method was found to be accurate, reproducible, and consistent. It was successfully applied for the analysis of these drugs in marketed formulations and could be effectively used for the routine analysis of formulations containing any one of the above drugs, or a combination, without any alteration in the chromatographic conditions.

Keywords:

Liquid Chromatography; Ciprofloxacin Hydrochloride, Ofloxacin, Tinidazole and Ornidazole; Combined dosage forms; Simultaneous estimation

1. Introduction

Ciprofloxacin Hydrochloride (1-cyclopropyl-6-fluoro-1, 4-dihydro-4-oxo-7-(1-piperazinyl)-3-quinolinecarboxylic acid) and Ofloxacin (9-fluoro-2,3-dihydro-3-methyl-10-(4-methyl-1-piperazinyl)-7-oxo-7H-pyrido[1,2,3-de]-1,4-benzoxazine-6-carboxylic acid) are fluoroquinolones and antimicrobials with potent activity against a broad spectrum of bacteria. Tinidazole (1-(2-ethylsulfonyl-ethyl)-2-methyl-5-nitro-imidazole) and Ornidazole (1-(3-chloro-2-hydroxypropyl)-2-methyl-5-nitro imidazole) are antiprotozoal and antibacterial drugs [1, 2, 3]. The structures of these four drugs are shown in Fig. 1. These drugs are being used either alone or in combination for the treatment of diarrhoea and dysentery of amoebic, bacterial or mixed origin [4].