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A rapid and reliable determination of doxycycline hydrochloride by HPLC with UV detection in pharmaceutical samples

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Abstract. An accurate, sensitive and reproducible high performance liquid chromatography (HPLC) method for the quantification of doxycycline hydrochloride in pharmaceutical samples has been developed and validated. The drug and the standard were eluted from a Lichrosorb RP-8 (250 mm × 4 mm, 10 µm particles) column at 30 °C with a mobile phase consisting of methanol, acetonitrile and 0.01 M phosphate dibasic at a flow rate of 1.2 L min⁻¹. The flow rate was 1.25 mL min⁻¹. A UV detector set at 260 nm was used to monitor the effluent. Each analysis required 10 µL of a 10 µg mL⁻¹ sample. The limits of detection and quantification were 1.15 and 3.82 µg mL⁻¹, respectively. Recoveries for different concentrations ranged from 95.76 to 101.57%.

Keywords: high performance liquid chromatography; doxycycline hydrochloride; ultraviolet detection.

INTRODUCTION

Doxycycline (C₂₂H₃₃N₂O₆ · H₂O, molecular mass 462.3 g mol⁻¹, CAS number 17966-26-1), is the monohydrate of (4S,4S,5S,5R,6R,12aD)-6-(dimethylamino)-1,4,4a,5,5a,6,11,12a-octahydro-3,5,10,12,12a-pentahydroxy-6-methyl-1,11-dimethylpiperidine-2-carboxamide, a substance obtained from tetracycline or tetracycline or by other means.¹ It is a broad spectrum anti-bacterial tetracycline derivative with a wide range of activity against gram positive and gram negative organisms, including *Spirrochetes*, *Actinomyces* sp., and *Mycoplasma* sp.² It is the drug of choice in the treatment of sexually transmitted diseases. Doxycycline is preferred to other tetracyclines in the treatment of specific infections because of its fairly reliable absorption and its long half-life, which permits less frequent dosage. Doxycycline hydrochloride (C₂₂H₃₃N₂O₆ · HCl · 0.5C₁₂H₂₂O₁₁ · 0.5H₂O, molecular

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