

RESEARCH ARTICLE

DEVELOPMENT OF A UV-SPECTROPHOTOMETRIC METHOD FOR THE SIMULTANEOUS DETERMINATION OF TRAMADOL HYDROCHLORIDE AND PARACETAMOL IN BULK AND MARKETED PRODUCT

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A specific, rapid and simple UV spectrophotometric method with good sensitivity was developed and validated for the simultaneous quantification of tramadol HCl and paracetamol in bulk and marketed product by simultaneous equation method. From the optical characteristics of the proposed methods, it was found that the λ_{max} of tramadol-HCl and paracetamol was found to 271 nm and 248 nm respectively. Tramadol HCl and paracetamol obey linearity within the concentration range of 2.5-15 $\mu\text{g/ml}$ and 3-15 $\mu\text{g/ml}$. The %RSD is less than 2%. The percentage recovery values of pure drug from the pre-analyzed formulations were in between 99-103%. The analysis of the formulation showed good result in concentration in range of 98-101%. This analytical method is also applicable in ordinary laboratories and can be adopted for quality control tests for these drugs in marketed formulation.

Key words: UV spectrophotometric method, Tramadol-HCl, Paracetamol, Simultaneous determination.

INTRODUCTION

Tramadol-HCl (\pm cis-2-[(dimethylamino)methyl]-1-(*m*-methoxyphenyl)cyclohexanol hydrochloride) and paracetamol (N-(4-hydroxyphenyl)acetamide) have been extensively used as antipyretic and analgesic drugs (**Figure 1a, 1b**).

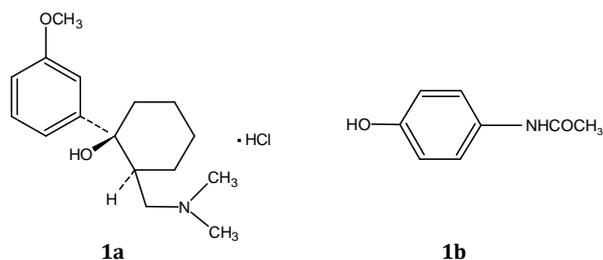


Figure 1a, 1b. Structures of tramadol-HCl and paracetamol

They are frequently prescribed in admixture with each other or in combination with other drugs. Literature revealed that several methods have been reported for the quantification of tramadol-HCl and paracetamol individually but yet no analytical method using UV spectrophotometer for their simultaneous quantification is reported. However, literature is enriched with reports showing application of spectrophotometric methods for simultaneous estimation of tramadol hydrochloride and chlorzoxazone in tablet (Puranik *et al* 2006), application of liquid chromatographic assay/GC-MS for simultaneous determination of tramadol and its active metabolite in human plasma