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Identification of Ketoprofen in Drug Formulation and Spiked Urine Samples by Micellar Thin Layer Chromatography and its Quantitative Estimation by High Performance Liquid Chromatography

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Abstract: A simple, selective and economical micellar thin layer chromatographic method for on-plate identification of ketoprofen from pure, pure, formulated and spiked urine samples was developed. The proposed method involves use of amino acid impregnated silica gel layers as stationary phase with mixed micelles (0.5% aqueous solutions of sodium dodecyl sulphate plus Triton X-100 and acetone (8:5:1.5, v/v) as mobile phase. The nature as well as the concentration of surfactant influences the mobility of ketoprofen. The interference study was carried out using various organic and inorganic metabolites, usually found in human urine. The HPLC determination of ketoprofen (formulated and spiked urine) samples carried out at $\lambda=270$ nm with mobile phase comprising of acetonitrile: double distilled water: acetic acid (1:1:1, v/v). The correlation coefficient was 0.99 and the recoveries of ketoprofen (formulated and spiked urine) were within range of 94.0-100.2% with relative standard deviation ranging from 0.6-0.86%.

Keywords: Ketoprofen, TLC, Surfactant, Urine

1. Introduction

Ketoprofen (Fig: 1) [RS-2-(3-benzoyl- phenyl) propionic acid], is a non steroidal anti-inflammatory drug¹. It is used in musculoskeletal, joint disorders, dysmenorrheal, postoperative pains and gout². Ketoprofen has been analysed by different techniques viz: HPLC^{3,4}, HPFA⁵, GCMS^{6,7} and spectrophotometry⁸ But these techniques require highly specified analytical samples, due to which these techniques are not found too appropriate in the analysis of drugs from biological samples⁹.

Thin layer chromatography (TLC) enables a simple fast and effective separation of the complex mixtures present in various biological samples enzymes¹⁰, porphyrins¹¹, alkaloid and drugs¹² from

urine samples. Surfactant-modified thin layer chromatography (TLC) has found wider applications in separation studies¹³⁻¹⁶. It provides enhanced selectivity as a result of difference in the degree of binding of separated mixture components with mobile and stationary phases. The selective solubilization of mixture components with micelles is caused by complex electrostatic, hydrophobic, donor-acceptor and polarization interactions. All types of surfactants (cationic, anionic and nonionic) have been used in the mobile phase for the successful separation of vitamins¹⁷, amino acids¹⁸. TLC proved its applicability during successful separation of bio-active amines, penicillin's and steroids¹⁹.