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Identification and Quantification of Lisinopril from Pure, Formulated and Urine Samples by Micellar Thin Layer Chromatography

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Abstract : Lisinopril, 1-[N-{(s)-I-carboxy-3 phenyl propyl}-L-proline dehydrate is a lysine analog of enalaprilat, the active metabolite of enalapril. It is long-acting, non-sulhydryl angiotensin-converting enzyme (ACE) inhibitor that is used for the treatment of hypertension and congestive heart failure in daily dosage 10-80 mg. Pharmacological activity of lisinopril has been proved in various experimental and clinical studies. Owing to its importance and widespread use, efforts have been made towards the development of simple and reliable analytical methods. As per our literature survey, lisinopril in pharmaceutical formulations has been determined by various analytical methodologies like polaragraphy, potentiometry, and spectrophotometry, but most of these analytical methods are not too suitable for the Identification of lisinopril from clinical samples because of the interferences caused by the amino acids and amino groups containing metabolites present in biological samples. This report is an attempt in the direction of developing a simple and reliable method for on plate identification and quantification of lisinopril in pharmaceutical formulations as well as from human urine samples using silica gel H layers developed with a new mobile phase comprising of micellar solutions of N-cetyl-N, N, N-trimethylammonium bromide (CTAB). Micellar solutions have found numerous practical applications in many areas of separation science. Micellar liquid chromatography (MLC) has gained immense popularity and wider applicability due to operational simplicity, cost effectiveness, relatively non-toxicity and enhanced separation efficiency, low aggressiveness. Incorporation of aqueous micellar solutions as mobile phase was pioneered by Armstrong and Terrill as they accentuated the importance of TLC where simultaneous separation of ionic or non-ionic species in a variety of matrices is required. A peculiarity of the micellar mobile phases (MMPs) is that they have no macroscopic analogues, as a result the typical separations can be easily achieved by using MMPs than aqueous organic mobile phases. Previously MMPs were successfully employed in TLC based critical separations of aromatic hydrocarbons, nucleotides, vitamin K1 and K5, o-, m- and p- aminophenol, amino acids, separation of penicillins. The human urine analysis for identification of selected drugs and their metabolites has emerged as an important investigation tool in forensic drug analysis. Among all chromatographic methods available only thin layer chromatography (TLC) enables a simple fast and effective separation of the complex mixtures present in various biological samples and is recommended as an approved testing for forensic drug analysis by federal Law. TLC proved its applicability during successful separation of bio-active amines, carbohydrates, enzymes, porphyrins, and their precursors, alkaloid and drugs from urine samples.

Keywords : lisnopril, surfactant, chromatography, micellar solutions
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