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RESEARCH ARTICLE

Determination of Prasugrel Hydrochloride in Bulk and Pharmaceutical Formulation Using New Ion Selective Electrodes

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ABSTRACT:
The construction and performance characteristics of Prasugrel hydrochloride (PRS) selective electrodes were developed. Electrodes were based on the incorporation of PRS with pairing agents, Ammonium Molybdate (MOL) and Nessler reagent (NES). The electrodes displayed a Nernstian response with a mean calibration graphs slopes of 59.21, 27.57 mv.decade^{-1} for the two electrodes respectively, over linear concentration range 10^{-2} –10^{-5} mol L^{-1} of the drug, with detection limits 0.063, 0.090 µM and quantification limits 0.27, 0.192 µM for electrode 1 and 2 respectively. The safe pH range of the proposed electrodes was (1-4). The influence of possible interfering species such as inorganic cations and pharmacologically related compounds was studied. The electrodes showed a fast response of (20 ± 2 sec, 17 ± 2 sec) for a period of 11 days, 9 days for electrode 1 and 2 respectively without significant change in electrode parameters. The methods are precise as shown by mean recoveries range of (97.7-102.5 %) – (97.3-101 %) with a mean relative standard deviation less than 3.14 and 4.46% for electrode 1 and 2 respectively. The results were compared to those obtained by a reference method. The proposed electrodes were used for the determination of PRS in pure form and pharmaceutical formulation.

KEYWORDS: Ion selective electrodes, Prasugrel, Nernstian slope, potentiometric determination, Ammonium Molybdate, Nessler reagent.

INTRODUCTION:
Prasugrel chemically is 5-[2-cyclopropyl -1-(2-fluoro-phenyl) 2-oxoethyl]-4,5,6,7-tetra hydrothieno [3,2-c] pyridine2-yl acetate[1]. Prasugrel is a platelet inhibitor belonging to thieno pyridine class developed by Daiichi Sankyo Co. and produced by Ube and currently marketed in the United States (US) in cooperation with Eli Lilly [2, 3]. On July 10, 2009, the US FDI approved the use of Prasugrel for the reduction of thrombotic cardiovascular events [4]. It acts as adenosine di-phosphate (ADP) receptor antagonist.

Although Clopidogrel is a widely prescribed agent it has some limitation, because of that, researchers developed more effective agents such as the novel Prasugrel, which makes it different is its safety profile and pharmacokinetic properties. Literature revealed very few methods for the estimation of Prasugrel hydrochloride such as LS-MS [5], HPTLC [6], HPLC [7] and UV spectrophotometric method [8].

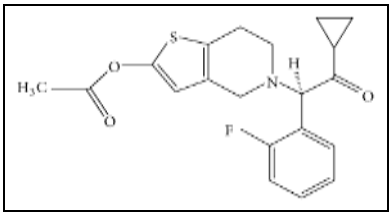

Fig .1: Chemical structure of PRS

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