

Potentiometric Determination of vancomycin using Ion- Selective Electrode

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Abstract

In this study, potentiometric determination of small amounts of vancomycin hydrochloride using ion-selective membrane electrode has been investigated. Design and preparation of electrode is based on PVC membrane, Vancomycin- phosphomolibdic ion pair as the sensing element, DBP as plasticizer and THF as solvent. The electrode exhibits a Nernstian response with a slope of about 56/02 mv in concentration range of 10^{-5} - 10^{-2} M in pH range of 4-6. The low detection limit of the electrode is about 3×10^{-5} and the response time of about 15 s. The proposed electrode was used for at least 4 weeks without any measurable change in sensitivity. No interference was observed towards some inorganic ions and also some drugs. The electrode was successfully employed for the measurement of Vancomycin-Hydrochloride in the form of vial purchased from the local pharmacy and good recovery about %97 was obtained. With regards to the simplicity ,speed,accuracy,sensitivity,selectivity and good recovery this electrode can be used as a convenient and reliable tool for quantitative analysis of vancomycin.

Keyword: Vancomycin, Ion-selective electrode, Potentiometric Determination

1. INTRODUCTION

The potentiometric membrane sensors have shown to be very effective tools for the analysis of a wide variety of metal ions and organic ions. They are very simple, fast, inexpensive and capable of providing reliable responses in a broad concentration range. [1]

Vancomycin drug is an antibiotic which is widely used as an antibacterial medicine for treatment and prevention .It is white powder with fomula $C_{66}H_{75}Cl_2N_9O_{24}.HCl$ and Molecular Weight 1485/73 g/mol. Vancomycin is primarily used for the treatment of serious infections caused by gram-positive bacteria known or suspected to be resistant to other antibiotics. The chemical structure of vancomycin is shown in Figure 1. [2]