Two Novel Potentiometric Sensors for Determination of Clonidine in Some Pharmaceutical Formulation

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Two novel membrane sensors with cylindrical configuration for clonidine HCl have been developed. The electroactive material incorporate β - or γ - cyclodextrin as ionophores. Sensor 1 and 2 were fabricated utilizing β - and γ - cyclodextrin in presence of potassium tetrakis (4-chlorophenyl)borate (KTPCIPB) as ion additive, PVC as matrix and o-nitrophenyl octyl ether (o-NPOE) as plasticizer. Both sensors showed a significant response to clonidine with near-Nernstian cationic slope of 53 and 54 mV/ decade over a relative wide dynamic range of 1×10^{-2} - 6.0×10^{-6} and 1×10^{-2} - 5.5×10^{-6} M, for sensor 1 and 2 respectively. The detection limits were 5×10^{-6} and 3.5×10^{-6} M for sensor 1 and 2 in the pH range of 2-7. The developed sensors using the novel ionophores were improve the selectivity for clonidine in presence of different ions. The determination of 230.09 $\mu\text{g/ml}$ of clonidine show good accuracy and precision (101.99 and 10.89% and 2.77 and 3.36% respectively) for sensor β - and γ -CD, respectively. The investigated sensors have been connected for determination of clonidine in its dosage form and contrasted with those got utilizing the HPLC technique. The sensors have been used as pointer sensors for determination of clonidine by potentiometric titration. The investigated sensors revealed good analytical characteristics include, high selectivity, fast response, long life time, good stability with high accuracy and precise.

Keywords: Clonidine HCl, β - and γ - cyclodextrin, ionophore, Potentiometry

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