

A Novel Glassy Carbon Electrode Modified with Multi-Walled Carbon Nanotubes for Potentiometric Xipamide Determination

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Abstract

Solid contact electrodes are widely used in analytical fields due to their outstanding performance over classical ones. However, they showed formation of a water layer affecting stability of those electrodes' type. Herein, we develop a solid contact ion selective electrode to overcome this common drawback through application of multi-walled carbon nanotubes as a hydrophobic layer between the ion sensing membrane and a glassy carbon electrode. This fine modification improved stability of the electrode via preventing the formation of this water layer. The obtained potential was steady over 30 days with a drift of -0.8 mV h^{-1} . The MWCNTs-modified electrode was used for determination of xipamide with a Nernstian slope of -56.01 over a linearity range of 1.0×10^{-6} to $1.0 \times 10^{-4} \text{ mol l}^{-1}$ and detection limit of $6.0 \times 10^{-7} \text{ mol l}^{-1}$. The proposed sensor was effectively applied for determination of the cited drug in its marketed pharmaceutical dosage form and spiked human plasma.

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