Prospective of Ultrasensitive Nanometal Oxides Electrochemical Sensors for Pharmaceutical Analysis of Antihistamine Drug Fexofenadine Hydrochloride

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Promising advancement in nanoscience and nanomaterials has witnessed various triumphs of metal oxide nanoparticles due to their unique properties and wide applications. The exotic and multi-functional activity of ZnO and CuO nanoparticles, encourage the scientific researchers payed an extensive attention to these metal oxides as a remarkable and active materials in the electrochemical and sensing applications. The suggested study described a comparative evaluation of sensitivity and selectivity of two fabricated coated wire membrane sensors enriched with zinc oxide and copper oxide nanoparticles with other conventional types for the quantification of antihistamine drug fexofenadine hydrochloride (FFN). The outcome results revealed linear behavior of the enriched ZnO and CuO nano sensors over the concentration ranges 1.0×10^{-9} - 1.0×10^{-2} , 1.0×10^{-10} - 1.0×10^{-2} mol L⁻¹, respectively, with respect to 1.0×10^{-6} - 1.0×10^{-2} mol L⁻¹ for the conventional coated wire types. The regression equations were $E_{mv} = (52.1 \pm 0.7) \log (FFN) + 521$, $E_{mv} = (59.7 \pm 0.3) \log (FFN) + 744.31$ for enriched nanometal oxides, respectively, $E_{mv} = (55.0 \pm 0.5) \log (FFN) + 510.4$ and $E_{mv} = (60.083 \pm 0.4) \log (FFN) + 821.94$ for conventional type with correlation coefficients 0.9995, 0.9999, 0.9997 and 0.9998 for the previously mentioned sensors respectively.

Keywords: Fexofenadine hydrochloride; Electrochemical sensors; Metal oxide nanoparticles

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