Abstract Submitted
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Application of Carbon Nanotubes as Working Electrodes for Cyclic Voltammetry & Impedance Spectroscopy[1] JOSEPH BARRIOS, UTSA MEMS Lab, MURILO CABRAL, EMANUEL CARRILHO, USP, Insitute of Chemistry at Sao Carlos, CARLOS GARCIA, UTSA, Dept. of Chemistry, ARTURO AYON, UTSA, MEMS Lab — Research conducted focuses on applications of Multi Walled Carbon Nanotubes (MWCNTs) serving as working electrodes for cyclic voltammetry (CV) and impedance spectroscopy. Expectations of increased electrochemical properties of the working electrodes were confirmed and the analysis of CNTs electrical properties was obtained. Conditions for the MWCNTs are as follows: after acidic functionalization, MWCNTs bonded with N-hydroxysuccinimide, and MWCNTs bonded with the AChE protein. Iron cyanide was chosen as the optimal analyte solution. Concentration of MWCNTs on the working electrode was also investigated. With CV an increase in capacitance, sensitivity, and sensibility was noticed. When compared to the unmodified graphite carbon electrode the modified electrode yielded lower resistivity, and higher capacitance. When compared to NHS and the AChE protein, the functionalized CNTs yielded a higher capacitance, increased sensitivity and sensibility with decrease in surface roughness. Through FTIR analysis the presence of increased carboxyl groups, enzymes, and N-hydroxysuccinimide on the walls of the MWCNTs was confirmed. In conclusion the addition of MWCNTs improved the electrodes sensitivity and sensibility for CV.

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