ELECTROCHEMICAL RESPONSE VERSUS DOPAMINE AND ASCORBIC ACID OF A CARBON NANOTUBE MODIFIED ELECTRODE

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A novel strategy to selectively detect dopamine (DA) in the presence of ascorbic acid (AA) using a doubly-modified glassy carbon electrode (GCE) using β-cyclodextrin (β-CD) as molecular receptor and multiwall carbon nanotubes (MWCNT) as enhancer of electron transference will be presented. The guest DA molecule inside the immobilized β-CD host acts as a mediator that ensures a better electrical contact between the GCE and the bulk DA solution. Moreover the MWCNT adjacent to the β-CD enhances the electron transference improving the overall electrochemical response of the DA detection system.

The proposed β-CD/MWCNT/GCE increases the rate of electron transfer of dopamine that is corroborated by the oxidation potential shift toward more negative potentials and the fact that the DA redox process is more reversible. The DA response improves notoriously comparing to other reported systems. The response of the developed system toward DA in the presence of higher concentrations of AA show no alterations. Moreover the modified electrode provides a higher selectivity in voltammetric measurements of DA compared to the non-modified electrode.