

Tailoring electroactive surfaces by non-template molecular assembly. Towards electrooxidation of L-cysteine

Santander-Nelli, Mireya

Silva, Carlos P.

Espinoza-Vergara, Javier

Silva, Juan F.

Olguín, Camila F.

Cortés-Arriagada, Diego

Zagal, José H.

Mendizabal, Fernando

Díez-Pérez, Ismael

Pavez, Jorge

© 2017 Elsevier Ltd We have prepared a nanoelectrode ensemble containing vertically aligned single walled carbon nanotubes (SWCNTs) using a non-template molecular self-assembling strategy. We used a bottom-up construction approach to assemble amino functionalized SWCNTs (af-SWCNTs) in a well-defined architecture. These af-SWCNTs were linked and vertically aligned to pre-formed self-assembled monolayers of 4-MBA. A Cobalt(II) tetracarboxyphthalocyanine (Co(COOH)₄Pc) complex was covalently bonded to external portion of af-SWCNTs to complete the final nanoelectrode ensemble. X-ray photoelectron spectroscopy (XPS) and Atomic Force Microcopy (AFM) confirmed the effectiveness of the assembling steps on the gold surface starting from the Au/MBA SAMs. The system Au/4-MBA/af-SWCNTs shows an interface with large ordered array, which exhibits a high activity for the electrooxidation of L-cysteine (L-cys). Theoretical calculations suggest that the incorporation of the af-SWCNTs increased the activ