

Heterogeneous Electron Transfer and Oxygen Reduction Reaction at Nanostructured Iron(II) Phthalocyanine and Its MWCNTs Nanocomposites

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ABSTRACT

Electron transfer and oxygen reduction dynamics at nanostructured iron(II) phthalocyanine/multi-walled carbon nanotubes composite supported on an edge plane pyrolytic graphite electrode (EPPGE-MWCNT-nanoFePc) platform have been reported. All the electrodes showed the category 3 diffusional behaviour according to the Davies – Compton theoretical framework. Both MWCNTs and MWCNT-nanoFePc showed huge current responses compared to the other electrodes, suggesting the redox processes of trapped redox species within the porous layers of MWCNTs. Electron transfer process is much easier at the EPPGE-MWCNT and EPPGE-MWCNT-nanoFePc compared to the other electrodes. The best response for oxygen reduction reaction was at the EPPGE-MWCNTnanoFePc, yielding a 4-electron process.