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Authors: S.M. El-Refaei, M.I. Awad, B.E. El-Anadouli, M.M.

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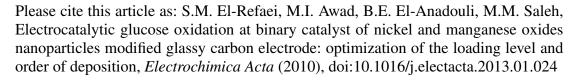
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Electrocatalytic glucose oxidation at binary catalyst of nickel and manganese oxides nanoparticles modified glassy carbon electrode:

optimization of the loading level and order of deposition

S. M. El-Refaei, M. I. Awad*, B. E. El-Anadouli, M. M. Saleh**,

Department of Chemistry, Faculty of Science, Cairo University, Cairo, Egypt

Abstract

This work addresses the electrocatalytic activity of a new catalyst composed of

nickel and manganese binary oxides, prepared by electrodeposition, towards glucose

electro-oxidation in alkaline medium. Cyclic voltammetry, scanning electron microscopy

(SEM) and energy-dispersive X-ray spectroscopy (EDX) were used to characterize those

electrocatalysts. It has been found that the electrocatalytic activity critically depends on

the loading level and the order of deposition of the two oxides; the NiO_x/MnO_x/GC

electrode (MnO_x deposited first) showed an excellent electrocatalytic activity and

stability towards glucose oxidation compared to NiO_x/GC, MnO_x/GC or MnO_x/NiO_x/GC

electrodes (NiO_x deposited first). At the present work conditions, it has found that, the

optimum loading level is 60 cycles of MnO_x followed by 10 minutes deposition of nickel.

At this loading level, it has been found that, the relation between $I_n/v^{1/2}$ function and scan

rate gives the characteristic feature of a catalytic process.

Keywords: Glucose, Manganese oxide, Nickel oxide, Fuel Cell, Nanoparticles

* Corresponding Author, e-mail: mawad70@yahoo.com

** e-mail: mahmoudsaleh90@yahoo.com

Tel: (202)-3567-6603, Fax: (202)-3567-7556

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