

# Comparative electrodeposition of Ni–Co nanoparticles on carbon materials and their efficiency in electrochemical oxidation of glucose

Adina Arvinte<sup>1</sup> · Florica Doroftei<sup>1</sup> · Mariana Pinteala<sup>1</sup>

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**Abstract** The use of carbon materials (graphene, multi-wall carbon nanotubes, and fullerene) as templates for comparative electrodeposition of Ni–Co nanostructures is described. Operating conditions and parameters were found to influence in a challenging manner the morphology and electrochemical activity of the electrodeposited Ni–Co nanoparticles. The electrocatalytic properties of Ni–Co/carbon material-modified electrode toward the

glucose oxidation were analyzed via cyclic voltammetry and amperometry. The studies showed that Ni–Co/MWNT electrode displayed the highest electrocatalytic activity, attributed to the high density of Ni–Co nanoparticles deposited on the carbon nanotubes support. A low detection limit of 1.8  $\mu\text{M}$  glucose with a good sensitivity of  $1868 \mu\text{A mM}^{-1} \text{cm}^{-2}$  was obtained for electrochemical detection at Ni–Co deposited on MWNT.

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✉ Adina Arvinte  
adina.arvinte@icmpp.ro

<sup>1</sup> “Petru Poni” Institute of Macromolecular Chemistry, Centre of Advanced Research in Nanobioconjugates and Biopolymers, Grigore Ghica Voda Alley 41A, 700487 Iasi, Romania