

# In situ Electroreduction of Graphene Oxide: Increased Sensitivity for the Determination of NADH

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A novel and useful method to catalyze the electro-oxidation of nicotinamide adenine dinucleotide (NADH) over a glassy carbon electrode (GCE) modified with graphene oxide (GO) is presented. Based on the presence of oxygen moieties in GO, which can be easily reduced, an in situ electrochemical generation of reduced graphene oxide (denoted as erGO) applying a sufficient negative potential. A potential of  $-1.000$  V was selected to generate the erGO/GCE as a pretreatment potential before the detection of NADH. The in situ generated erGO/GCE system produces a decrease in the overpotential of NADH oxidation from  $+0.720$  V to  $+0.230$  V compared with GCE. The process also produced an important increase in current signals. The modified electrode was characterized by scanning electron (SEM) and electrochemical microscopies (SECM), cyclic voltammetry and by Raman spectroscopy. Amperometric detection of NADH via this straightforward electrocatalytic method provides a wide linear range between  $10$  and  $100$   $\mu$ M, a lower detection limit of  $0.36$   $\mu$ M and an excellent sensitivity of  $(1.47 \pm 0.09)$   $\mu$ A mM $^{-1}$ .