The present work describes the sensitive and low-potential detection of hydroquinone (HQ) using a glassy carbon electrode (GCE) modified with nanodiamond (ND). The presence of ND was confirmed by high-resolution scanning electron microscopy, FTIR and Raman spectroscopy. The cyclic voltammetry results reveal that ND modified GCE has high electrocatalytic activity towards oxidation of HQ than unmodified GCE. In addition, the ND modified GCE shows a significantly lower oxidation potential towards CC than unmodified GCE, which is due to the presence of –OH functional groups in ND. The CV studies confirm that the redox electrochemical behavior of CC is a diffusion controlled electrochemical process on ND modified electrode. The ND modified electrode was able to detect the
HQ across a linear response range from 1.0 to 78.0 µM. The limit of detection of the sensor was 0.19 µM. The sensor shows an appropriate selectivity in the presence of 20-fold concentrations of benzenediols and neurotransmitters. The practicality of the sensor is appropriate and shows excellent recovery of HQ in lab water samples.

**Keywords:** Nanodiamond; Modified electrode; Cyclic voltammetry; Hydroquinone, Electroanalysis

© 2017 The Authors. Published by ESG (www.electrochemsci.org). This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution license (http://creativecommons.org/licenses/by/4.0/).