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# Mesoporous cobalto-cobaltic oxide modified glassy carbon electrode for simultaneous detection of hydroquinone and catechol

Shiqiang Cui <sup>a</sup>, Li Li <sup>b</sup>, Yaping Ding <sup>\*a, b</sup>, Jiangjiang Zhang <sup>a</sup>

<sup>a</sup> School of Materials Science and Engineering, Shanghai University, Shanghai 200444, P.R. China

<sup>b</sup> Department of Chemistry, Shanghai University, Shanghai 200444, P.R. China

\* Corresponding author: wdingyp@sina.com

## Abstract

The  $\text{Co}_3\text{O}_4$  electro-catalysts with the mesoporous structure were prepared by the sacrificing template method. The chemical composition, structural and morphological characterizations of  $\text{Co}_3\text{O}_4$  were examined by X-ray diffraction (XRD), X-ray photoelectron spectroscopy (XPS), scanning electron microscopy (SEM), transmission electron microscopy (TEM) and nitrogen adsorption-desorption (BET). The electrochemical properties of the meso- $\text{Co}_3\text{O}_4$  were investigated by differential pulse voltammetry (DPV) and cyclic voltammetry (CV) for the simultaneous detection of hydroquinone (HQ) and catechol (CC) in the phosphate buffer media (PBS). Based on the meso- $\text{Co}_3\text{O}_4$  modifier electrode, a sensitive electrochemical sensor for phenolic compounds was successfully fabricated. Under optimal conditions, the detection limits of HQ and CC were found to be 0.1 and 0.1  $\mu\text{M}$  ( $S/N = 3$ ), respectively. The outstanding catalytic capability of meso- $\text{Co}_3\text{O}_4$  catalysts may be associated with their large surface area provided by mesoporous structure.

**Keywords:** Mesoporous  $\text{Co}_3\text{O}_4$ , Simultaneous determination, Hydroquinone, Catechol, Electrochemical sensor

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\* Corresponding author: Tel: +86-21-66134734; Fax: +86-21-66132797

Address: Department of Chemistry, Shanghai University, Shanghai 200444, PR China

E-mail address: wdingyp@sina.com

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