Electrochemical Detection of Norepinephrine Using Sponge-like Co₃O₄ Modified Screen Printed Carbon Electrode

Sathiyar Anandaraj¹, Tse-Wei Chen², Shen-Ming Chen^{2,*}, Elanthamilan Elaiyappillai¹, Sarala Loganathan¹, Sharmila Lydia Ibrahimsa¹, Princy Merlin Johnson^{1,*}, Steplin Paul Selvin¹, Wen-Hui Weng^{3,*}, Wai-Hung Leung^{3,4,*}

¹PG & Research Department of Chemistry, Bishop Heber College (Autonomous), Tiruchirappalli-620 017, Tamil Nadu, India

²Department of Chemical Engineering and Biotechnology, National Taipei University of Technology, Taipei, Taiwan (ROC)

³Graduate Institute of Biochemical and Biomedical Engineering, National Taipei University of Technology, Taipei City 106, Taiwan, R.O.C.

⁴Division of Colorectal Surgery, Department of Surgery, Mackay Memorial Hospital, Taipei City 104, Taiwan, R.O.C.

*E-mail: smchen78@ms15.hinet.net, wendywwh@ntut.edu.tw, leungwh22@gmail.com

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Neural diseases, like Parkinson's and Alzheimer's widely increase portions of degenerative nerve disease, are related to norepinephrine (NE) concentration with proportional correlation. Quantification of NE is difficult as NE coexists with dopamine (DA), ascorbic acid (AA), and uric acid (UA), which interfere with the detection of NE in biological samples. We report the fabrication of sponge-like Co₃O₄ particles modified screen printed carbon electrode for highly selective and sensitive detection of NE. Compared with recent studies, our newly developed sensor appears to have not only a wide detection range (0.1-1525 µM) but also superior detection limit (75 nM). The Co₃O₄ particles were prepared by simple, very cheaper and reproducible method. The effect of concentration and kinetics of electrochemical detection of NE were studied. Furthermore, the modified electrode was appreciable stability, repeatability and reproducibility. In addition, the practical feasibility of the modified sensor is demonstrated in biological samples.

Keywords: Nanomaterials, metal nanoparticles, electrocatalysis, electrochemical methods, sponge like Co₃O₄, neurodegenerative diseases, norepinephrine.

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