



Electrooxidation of nitrite based on green synthesis of gold nanoparticles using Hibiscus sabdariffa leaves

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Abstract:

In this study, gold nanoparticles (Au-NPs) were synthesized through green biosynthetic route using water extract of Hibiscus sabdariffa leaves (*H. sabdariffa* L.) which acted as both reductant and stabilizer agents. The synthesized Au-NPs were characterized by UV-vis spectroscopy, XRD, TEM, FESEM, EDX, zeta potential, and FTIR spectroscopy. By analyzing the UV-vis, FTIR and HPLC data, and comparing with previous studies, the presence of chlorogenic acid in *H. sabdariffa* L. was identified as the major antioxidant compound involved in the reduction of Au³⁺ ions. The FESEM micrograph and TEM images visualized that Au-NPs were formed with a narrow distribution and an average particle size of 7 ± 2 nm at stirring time of 80 min. As for application, the electrooxidation of nitrite was studied with Au-NPs. The electrocatalytic activity of bare GCE and Au-NPs/GCE towards the electrooxidation of nitrite was examined and compared via cyclic voltammetry. Higher electrooxidation of nitrite ions for the synthesized Au-NPs was observed at a stirring time of 80 min. The prepared material showed a linearity of 0.37–10 mM towards nitrite electrooxidation, with the detection limit of 0.11 mM (S/N = 3). Moreover, the prepared electrode presented acceptable stability, repeatability and reproducibility.

Biography:

Siti Husnaa Mohd Taib is currently pursuing a PhD in Chemical Engineering at Universiti Teknologi Malaysia. Her project focuses on the green synthesis of nanohybrid and nanoparticles for electrooxidation of nitrite. Siti Husnaa completed her master's degree in Halal Products Science in 2015 and her undergraduate studies in Petro-



leum Chemistry in 2010 at Universiti Putra Malaysia. Her research interest lies in the area of nanomaterial, ranging from preparing to its application.

Publication of speakers:

1. Effect of degree of deacetylation of chitosan on thermal stability and compatibility of chitosan-polyamide blend; AH Zainoha Zakaria, Zatil Izzah, Mohammad Jawaid.
2. Preparation and characterization of hydrophilic polyurethane scaffolds by electrospinning and radiation induced grafting of 2-hydroxyethylmethacrylate; ZI Tarmizi, MM Nasef, ML Nallappan, NBA Khairudin, RR Ali, A Ahmad.
3. Fabrication and Characterization of PU-g-poly (HEMA) Film for Clotting Time and Platelet Adhesion; ZI Tarmizi, RR Ali, MM Nasef, AM Akim, Z Eshak, SM Noor.
4. A Study on Biological Sample Preparation for High Resolution Imaging of Scanning Electron Microscope; SR Aid, NNAAN Zain, NNM Rashid, H Hara, K Shameli, I Koji.
5. Fabrication of hydrophilic silica coating varnish on pineapple peel fiber based biocomposite; ZI Tarmizi, AN Maski, RR Ali, NWC Jusoh, AM Akim, Z Eshak, SM Noor.

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