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Electrochemical preparation and characterization of gold nanoparticles graphite electrode: Application to myricetin antioxidant analysis

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Graphite has been an attractive material for electrochemical analysis due to its attributes in terms of its physical, chemical inertness and also because of its low cost, abundantly available, reusable and can be obtained in various forms such as rod, sheet, and flexible sheets. However its electrochemical properties are often a drawback when compared to other solid metal electrode, but this can be improved by surface modification of the graphite with noble metal nanoparticles. In recent years, antioxidant analysis by electrochemical techniques has been the focus of many studies; this is because the technique is sensitive, rapid and possible for field analysis. These advantages had overcome the problem of anti-oxidant analysis, which are sensitive to environment oxidation and therefore a fast analysis procedure is always preferable. In this present paper, we have carried out the electrochemical improvement of a recycled graphite electrode through an optimized procedure by electro-deposition of the gold nanoparticles on the graphite surface. An improvement on the electrochemical properties of the graphite by enhancement of its effective surface area, heterogeneous electron transfer rate, over potential and also the sensitivity has been observed. Application of the fabricated gold nanoparticles graphite electrode was also successfully optimized for the qualitative and quantitative analysis of myricetin.

Biography

Guan Huat Tan is Professor in Analytical Chemistry at the Department of Chemistry, University of Malaya. He started his teaching career at the University of Malaya in 1978 after completing his PhD in Analytical Chemistry from Duke University. He has supervised eight PhD and six MSc students and many thesis projects on environmental analysis of organic chemical pollutants in Malaysian waterways and pesticides in fruits and vegetables by using techniques such as GC, GC-MS, HPLC and LC-MS. He is currently supervising five PhD and one MSc student for their theses. He is also currently doing studies on developing microextraction techniques coupled to GCMS and LCMS for analysis of pesticide residues in food matrices such fruits and vegetables. He has presented and published many papers on the monitoring of priority environmental organic pollutants at various international and local symposiums and conferences as a result of his research findings.

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