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Development of Gold Porous Plate Electrode and Examination of Its Performance for Iodine Determination

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Abstract: A novel procedure for the construction of a home-made gold porous plate electrode is described. A plate of silver and gold alloy was treated with nitric acid or alternatively by anodic oxidation to remove the silver component, leaving a porous surface having active sites for adsorption. The performance of the electrode developed was tested using iodine solution as analyte material. The parameters related to the working conditions were optimized before the examination of analytical characteristics. Under the optimal conditions, the voltammetric results show that the gold porous plate electrode offers the detection limit of 2.18×10^{-5} M and reproducibility of 7.8% ($n = 4$). The electrode performance was compared with that of glassy carbon electrode (G.C.E), gold-wire and platinized Pt electrodes in terms of current density for 2×10^{-4} M iodine solution. In conclusion, it is observed that the gold porous plate electrode has better current density than gold wire and platinized Pt electrodes.

Key Words: Gold porous plate electrode, determination of iodine, voltammetry

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