

DEVELOPMENT OF GOLD ELECTRODE WITH ACTIVE COMPOUND 5-(4-DIMETHYLAMINO BENZYLIDENE)-RHODANINE FOR VOLTAMETRIC DIFFERENTIAL RATE DIFFERENTIAL ANALYSIS OF METAL IONS

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ABSTRACT

This research was carried out with the main objective of developing a voltammetric method of Au(III) analysis. The development was carried out to determine the quality of the voltammetric analysis method with the Differential Pulse Voltammetry (DPV) technique with a modified solid membrane working electrode 5-(4-dimethylaminobenzylidene)-rhodanine, to determine the optimum conditions (comparison of composition, pH, and reading speed) to determine the characterization of the membrane working electrode. solids that have been made, knowing several research parameters, namely linearity, detection limit, and the repeatability of electrode readings in the determination of Au(III).

Au(III) analysis was performed by DPV. Modification of solid membrane electrode was carried out by mixing 5-(4-dimethylaminobenzylidene)-rhodanine, carbon, and paraffin with mass ratios of 10:45:45, 20:40:40, 30:35:35, and 40:30:30. Measurements were made by dipping the electrode in a voltammetric cell containing 30 mL of Au(III) solution and 5 mL of 1 M KCl electrolyte solution. Au(III) measurements were carried out by varying pH 4, 5, 6, 7, 8 and varying the reading speed 10, 20, 30, 40, 50 mV/sec. The linear concentration area was tested in the concentration range of 10^{-7} – 10^{-10} M.

The modified solid membrane electrode 5-(4-dimethylaminobenzylidene)-rhodanine gave the peak current response in the measurement of Au(III) at -0.02 Volt vs Ag/AgCl. The best electrode composition ratio is 40:30:30. The optimum measurement conditions were obtained in a pH 5 buffer solution and a reading speed of 50 mV/sec. The linear concentration area obtained linearity with a regression value of 0.9964 and a detection limit of 10^{-10} M. The electrode repeatability was stable so that it was used for analysis of Pameungpeuk soil samples and obtained a gold content of 0.4725%.

Kata Kunci: *Au(III), electrode, Differential Pulse Voltammetry, 5-(4-dimethylaminobenzylidene)-rhodanine*