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# Forensic electro analysis of Δ9- tetrahydrocannabinol traces by square-wave voltammetry

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## Abstract

Marijuana is a widely consumed illicit drug. So, drug dealers have sought new ways to mask its forensic analysis. In this research, the square-wave voltammetric analysis of Δ9- tetrahydrocannabinol (Δ9-THC) in organic medium (N-N dimethylformamide) using tetrabutylammonium (TBATFB) as supporting electrolyte is described. Additionally, a comparison about the performance of two different working electrodes - a glassy carbon disc and a platinum disc – was investigated. The voltammetric measurements were carried out after a preconcentration step employing an electric potential of -1.2V. Under this condition, a well defined anodic peak current at 0.01V (vs. Ag/AgCl) is observed for Δ9-THC species. An accumulation time of 30 s is considered ideal for both working electrodes. The analytical curve obtained for Δ9-THC presented linear dependence at concentrations ranging from 1.0 x 10-9 mol L-1 to 2.2 x 10-8 mol L-1, with a linear correlation coefficient and a detection limit of 8.7 x 1010-10 mol L-1, and of 0.999, respectively, using the glassy carbon disc working electrode. The platinum disc working electrode enabled qualitative analysis of Δ9-THC at concentrations higher than 3.1 x 10-9 mol L-1. Δ9 THC can be quantitative assayed by the analytical curve method, offering an important comparison parameter for forensic investigation. These results demonstrated to be 10 fold more sensitive than the other voltammetric methods reported in the literature for Δ9-THC analysis. To the best of my knowledge, this is the first work on the direct determination of Δ9-THC by square-wave voltammetric technique.

## Biography

Marcelo Firmino de Oliveira has completed his PhD in analytical chemistry at the age of 30 years from Universidade Estadual Paulista – Instituto de Química, Brazil. He actuated as Criminal Expert in the Scientific Police of São Paulo State, Brazil, from 2002 until 2007. Actually, he is a Professor of Forensic Chemistry at Universidade de São Paulo – Departamento de Química - FFCLRP, Brazil. He has published more than 40 papers in reputed journals. His workgroup has 3 master students and 4 doctoral students.