

**DETECTION OF THE PESTICIDE THIABENDAZOLE (TBZ) USING
ELECTRODEPOSITED GOLD FILMS**

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Thiabendazole (TBZ) is a widely used fungicide in fruit and vegetable crops, and its residues may pose risks to human health. The development of rapid and sensitive detection methods is therefore essential for food safety and environmental monitoring. In this work, we report the fabrication of gold-based SERS (Surface-Enhanced Raman Scattering) substrates obtained by potentiostatic electrodeposition for the detection of TBZ at low concentrations. Gold films were electrodeposited at a constant potential of -0.95 V versus a saturated calomel electrode (SCE) in a conventional three-electrode electrochemical cell. Two electrolyte compositions were investigated: (i) 100 mmol L⁻¹ KCl and 1.4 mmol L⁻¹ HAuCl₄ (standard gold deposition bath), and (ii) the same solution with the addition of 1 mL of a 1.0 × 10⁻³ mol L⁻¹ TBZ solution, aiming to promote the incorporation of the analyte during film growth. After deposition, the substrates were immersed in a 1.0 × 10⁻⁵ mol L⁻¹ TBZ solution in ethanol for 24 h and subsequently dried under ambient conditions. Raman spectra revealed the characteristic vibrational bands of TBZ at 781, 1014, 1282, 1459, and 1582 cm⁻¹, confirming the SERS activity of the

substrates. Films electrodeposited in the presence of TBZ exhibited improved analytical performance, with enhanced signal reproducibility and reduced spectral noise. These results suggest that the incorporation of TBZ during electrodeposition influences the nanostructure and surface activity of the gold films, promoting the formation of more homogeneous and SERS-efficient substrates. The proposed approach demonstrates potential for sensitive pesticide detection using electrochemically engineered plasmonic platforms.

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Palavras-chave: thiabendazole; electrodeposition; gold films.