Electochemical Detection of Imidacloprid Using a Screen Printed Single Walled Carbon Nanotubes Coated with and Ionic Liquids

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The simple modification of a screen printed single walled carbon nanotubes with ionic liquid 1-butyl-3-metilimidazolium tetrafluorborate allowed the development of a fast and selective methodology to determine imidacloprid (IMI). The morphological and conductive characteristics of the modified surface were analyzed with scanning electron microscopy and electrochemical impedance spectroscopy. The modified surface showed great activity towards the reduction of IMI to -1.2 V. The analytical variables were optimized using linear sweep voltammetry at 0.1 V for 60s, obtaining a limit of detection of 0.21 mg L⁻¹ (0.82 μmol L⁻¹). Relative standard deviation with six different electrodes was of 2.6 % (n = 5). Finally, the potential interferers were studied and the sensor was applied in the determination of IMI using samples of commercial honey with recovery between 88.0 and 105.0 % for IMI.

Keywords: Imidacloprid; Single walled carbon nanotubes; Ionic liquids; Screen printed electrode; Honey

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