

Three-dimensional Porous Carbon Materials from Waste of Botanical Drugs as an Efficient Biosensing Platform for Pesticides Sensing

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A novel trichlorfon biosensor is a carbon (3D-EUS) sensor prepared from AChE 3D porous *Eucommia ulmoides* (inner stem behind bark of *eucommia ulmoides*), which is a novel electrochemical biomolecular carrier material containing biological molecules proposed for the first time [1]. Here, a whole block of 3D-EUS loaded with acetylcholinesterase (AChE) molecules was used to prepare a 3D-EUS integrated electrode for trichlorfon biosensing. The morphologies of 3D-EUS and AChE/3D-EUS integrated electrodes were characterized by scanning electron microscope (SEM). And the results demonstrated that the electrode has a 3D macropore structure. The electrochemical behavior and Electrocatalytic Performance of AChE/3D-EUS integrated electrode were studied by cyclic voltammetry and differential pulse voltammetry. A sensor has the advantages of good stability, low detection limit (0.069 ng/mL) wide linear range (0.20-18 ng/mL), it can be used as an important platform for field detection of pesticide residues.

Keywords: 3D-EUS, AChE, integrated electrode, biomass carbon materials

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