

Sensors and Biosensors based on screen-printed electrodes modified with nanomaterials

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The use of nanomaterials in sensor and biosensor field is one of the hottest topics today in analytical chemistry. The advantage of using nanomaterials leads to sensors characterized by high sensitivity, stability, and minimization of surface fouling of the working electrode with an improved cost-efficiency. Screen-printed electrodes are recognized as successful sensors in modern electroanalytical chemistry due to their low background, wide potential window, easiness to use, cost-effectiveness, and easiness of surface modification. This last property allows to modify the screen-printed electrodes (SPEs) with several nanomaterials such as carbon nanotubes, carbon black, gold nanoparticles, nanostructured Prussian Blue etc.. The research activity carried out for the development of sensors and biosensors based on SPE modified with nanomaterials will be presented. For instance, the sensor for phosphate detection based on SPE modified with carbon black integrated in a flow analysis system, biosensors based on SPE modified with nanostructured Prussian Blue for pesticide and nerve agents detection, SPE modified with carbon black and gold nanoparticles for As³⁺ measurement will be reported.