

Nanochemistry and Nanobiotechnology

Carbon nanomaterials application in biosensor technology.

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Application of carbon nanomaterials as structural elements of bioselective membranes opens new possibilities for improvement and directed modification of analytical characteristics of amperometric biosensors. Carbon nanotubes and nanodiamonds are characterized by very small dimensions and, thus, a large specific surface area, a possibility of modifying by active groups, good biocompatibility, low toxicity, catalytic properties. These properties motivate using nanomaterials in biosensors for the improvement of their key analytical characteristics. A number of amperometric biosensors are developed for glucose and choline determination, which are based on nanocomposite biomembranes using single-walled carboxylated (oxidized) and aminated multiwalled carbon nanotubes and nanodiamonds of detonation synthesis. The developed nanocomposite biosensors provide highly selective, reproducible, rapid and accurate determination of the analyte, which largely determines their advantage over the physico-chemical methods of analysis. The working models of biosensor analyzers can serve as the prototypes of pilot samples for mass implementation in such fields as quality control of foods and pharmaceuticals.

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