Development of voltammetric sensors based on screen-printing technology for detection of creatinine

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This research study describes the sensing properties of screen-printed electrodes based on carbon and modified with single-wall carbon nanotubes, or graphene. The electrochemical signals of screen-printed sensors towards creatinine were registered. The screen-printed based sensors show good sensitivity for voltammetric detection of creatinine. Experimental conditions were investigated and optimized in order to improve the sensing performance characteristics. The sensors exhibit linear responses to creatinine over concentration ranges from 1 μM to 100 μM with detection limits in the range of 0.26-0.53 μM. The screen-printed based sensors were successfully used in quantification of trace amounts of creatinine in serum and urine samples. The simple instrumentation, short time need for analysis, minimal sample pre-treatment and small quantity of sample recommends this method as a valuable screening analytical method.

Keywords: screen-printing technology, sensor, voltammetry, creatinine

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