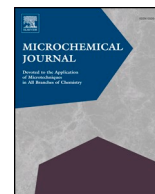




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A single drop histamine sensor based on AuNPs/MnO₂ modified screen-printed electrode



Sara Knežević^a, Miloš Ognjanović^b, Nemanja Nedić^a, José F.M.L. Mariano^c, Zorana Milanović^b, Branka Petković^d, Bratislav Antić^b, Sanja Vranješ Djurić^b, Dalibor Stanković^{b,*}

^a Faculty of Chemistry, University of Belgrade, Studentski trg 12-16, 11000 Belgrade, Serbia

^b The Vinča Institute of Nuclear Sciences, University of Belgrade, Mike Petrovića Alasa 12-14, 11000 Belgrade, Serbia

^c Department of Physics and CeFEMA, Faculty of Science and Technology, University of Algarve, Campus de Gambelas, Faro 8005-139, Portugal

^d Department of Chemistry, Faculty of Natural Science and Mathematics, University of Priština, Lole Ribara 29, 38220 Kosovska Mitrovica, Serbia

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ABSTRACT

In order to ensure high food quality, one of the prime importance is the detection and quantification of histamine, well known marine food poison. In this work, we constructed novel electrochemical biosensor for the detection of histamine based on gold nanoparticles decorated on manganese dioxide (Au/MnO₂) and used for modification of screen-printed carbon electrode (Au/MnO₂@SPCE). The constructed sensor was then used for the estimation of histamine content in a single drop. Materials used in this study were synthesized and characterized using HR-TEM, XRPD and electrochemical methods. The amperometric detection method was optimized and, under selected operating parameters (supporting electrolyte pH 6, working potential of 1 V), the proposed sensor possesses linear working range from 0.3 μM to 5.1 μM, with a detection limit of 0.08 μM. The effect of selected interferences was investigated and it was found that the developed approach offers accurate, precise, selective, fast and reproducible quantification of histamine using only one drop of the sample. In the end, this work stands as a proof-of-concept of the modified electrodes and electrochemical detection as a promising and prospective approach for the applications in real-time monitoring of the food quality.

* Corresponding author.

E-mail addresses: dalibors@chem.bg.ac.rs, daliborstankovic@vin.bg.ac.rs (D. Stanković).

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