

Ultra-low noise organic based devices to record bioelectrical signals in non-excitable cell populations: Applications in anticancer drug screening platforms

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Abstract

During the last ten years, the design of new enzyme-free electrochemical sensors based metal oxide nanoparticles has been described. Due to the electrocatalytic activity of these nanomaterials, these sensors allow the sensitive detection of different ions and molecules. They can replace advantageously enzymes due to their higher stability.

The presentation will be focused on the use of Kegging type polyoxometallates (POMs) for the detection of nitrite ions¹ and of hydrogen peroxide. The association of POMs with single-wall carbon nanotubes (image) allowed the increase of the sensitivity of detection of hydrogen peroxide by a factor of 38.52. The involved charge transfer mechanism will be detailed.

Other types of metal oxide nanomaterials such as perovskites will also be presented. A₂B_{0.4}O_{4+δ} type perovskite are alternance of perovskite ABO₃ and of rock salt AO layers, A being a lanthanide and B a metal. Detection limit of glucose is 0.5 μM and no interference of detection is observed in human serum. The involved charge transfer mechanism will be detailed.

This presentation shows the potentiality of metal oxide nanomaterials for biosensing.

Biography:

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