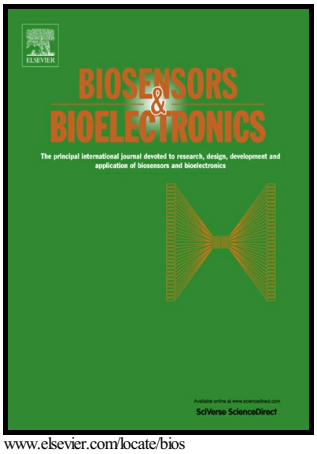

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Bio-Sensing Applications of Cerium Oxide Nanoparticles: Advantages and Disadvantages

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Abstract

Cerium oxide nanoparticles (CNPs) contain several properties such as catalytic activity, fluorescent quencher and electrochemical, high surface area, and oxygen transfer ability, which have attracted considerable attention in developing high-sensitive biosensors. CNPs can be used as a whole sensor or a part of recognition or transducer element. However, reports have shown that applying these nanoparticles in sensor design could remarkably enhance detection sensitivity. CNP's outstanding properties in biosensors which go from high catalytic activity and surface area to oxygen transfer and fluorescent quenching capabilities are also highlighted. Herein, we discuss the advantages and disadvantages of CNPs-based biosensors that function through various detection modes including colorimetric, electrochemistry, and chemoluminescent regarding the detection of small organic chemicals, metal ions and biomarkers.

Keywords: *Cerium oxide nanoparticles, Sensitivity, Electrochemical, Colorimetric, Fluorescent, Chemoluminescent*