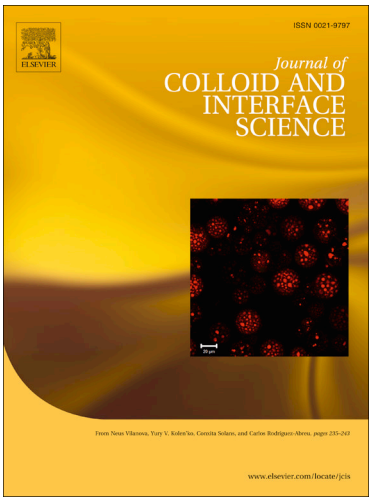

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Xiaowei Cheng, Le Huang, Xuanyu Yang, Ahmed A. Elzatahry, Abdulaziz Alghamdi, Yonghui Deng

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Rational Design of a Stable Peroxidase Mimic for Colorimetric Detection of H_2O_2 and Glucose: A Synergistic CeO_2/Zeolite Y Nanocomposite

Xiaowei Cheng,[1,*] Le Huang,[2] Xuanyu Yang,[1]

Ahmed A. Elzatahry,[3,*] Abdulaziz Alghamdi,[4] and Yonghui Deng[1]

[1] Department of Chemistry, State Key Laboratory of Molecular Engineering of Polymers, Shanghai Key Laboratory of Molecular Catalysis and Innovative Materials, iChEM (Collaborative Innovation Center of Chemistry for Energy Materials), Fudan University, Shanghai 200433, China.

[2] School of Environmental and Chemical Engineering, Shanghai University, Shanghai 200444, China.

[3] Materials Science and Technology Program, College of Arts and Sciences, Qatar University, P.O. Box 2713, Doha, Qatar.

[4] Department of Chemistry, College of Science, King Saud University, Riyadh 11451, Saudi Arabia.

*Corresponding Author: xwcheng@fudan.edu.cn (X. W. Cheng), aelzatahry@qu.edu.qa (A. A. Elzatahry).

Abstract Owing to the high costs and instability of natural enzymes, the development of enzyme mimics based on inorganic nanomaterials has attracted a wide concern in recent years. In this work, a stable nanocomposite composed of highly dispersed CeO_2 nanoparticles decorated on zeolite Y as support (CeO_2/Y) was synthesized by a facile wet impregnation method, and the CeO_2/Y nanocomposite was firstly proposed as an efficient peroxidase-mimicking nanozyme for accurate detection of H_2O_2 and glucose. The best catalyst was the nanocomposite with CeO_2 to zeolite Y mass ratio of 0.20 (denoted as 20CeO_2/Y), showing a better affinity and higher catalytic constant to the substrate of H_2O_2 and 3,3′,5,5′-tetramethylbenzidine (TMB) than horseradish peroxidase (HRP) enzymes by the steady-state kinetic analysis. The enzyme-mimicking catalyst could be used over a wider range of pH and temperature