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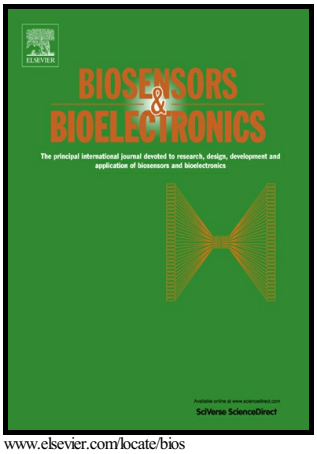

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PII: S0956-5663(16)30045-8
DOI: http://dx.doi.org/10.1016/j.bios.2016.01.045
Reference: BIOS8385

To appear in: *Biosensors and Bioelectronic*

Received date: 25 November 2015
Revised date: 5 January 2016
Accepted date: 16 January 2016

Cite this article as: Lingtian Wu, Shanshan Wu, Zheng Xu, Yibin Qiu, Sha Li an Hong Xu, Modified nanoporous titanium dioxide as a novel carrier for enzym immobilization, *Biosensors and Bioelectronic* http://dx.doi.org/10.1016/j.bios.2016.01.045

Modified nanoporous titanium dioxide as a novel carrier for enzyme immobilization

Lingtian Wu, Shanshan Wu, Zheng Xu, Yibin Qiu, Sha Li*, Hong Xu*

State Key Laboratory of Materials-Oriented Chemical Engineering

College of Food Science and Light Industry

Nanjing Tech University, Nanjing 211816, People's Republic of China

* Corresponding Author 1. Tel/Fax: +86-25-58139433;

E-mail address: xuh@njtech.edu.cn (Hong Xu)

* Corresponding Author 2. Tel/Fax: +86-25-58139433;

E-mail address: lisha@njtech.edu.cn (Sha Li)

Abstract

ε-Poly-L-lysine (EPL)-modified mesoporous titanium dioxide (M-TiO_2) was assembled through the electrostatic attraction between EPL and M-TiO_2. Through modification, the M-TiO_2 surface tends to form multilayered and complex architectures, which can be used as artificial matrices to change the microenvironment of carriers for enzyme immobilization. The modified M-TiO_2 was characterized through scanning electron microscopy, Fourier transform infrared spectroscopy, zeta potential analysis, and thermogravimetric analysis. All of the immobilized enzymes with negative charges display strong storage stability, thermal stability, and good reusability. Results indicate that EPL can self-assemble onto the surface of M-TiO_2 and form a considerable number of active coatings. Our results also demonstrate that