Novel Glucose Oxidase Interlocked Prussian Blue/Polysulfone Stereo-Structure and its Application in Amperometric Glucose Biosensor

Cang Wang¹, Min Pan¹, Hang Chen¹, Dajing Chen^{2,*}, Yuquan Chen^{1,*}

¹ Department of Biomedical Engineering, Zhejiang University, Hangzhou 310027, China

² Medical School, Hangzhou Normal University, Hangzhou, 311121, China

*E-mail: djchen@hznu.edu.cn

doi: 10.20964/2019.08.51

Received: 25 March 2019 / Accepted: 21 May 2019 / Published: 30 June 2019

In this study, we present a controllable Prussian Blue (PB)- Polysulfone (PSF) stereo-structure with glucose oxidase (GOD) interlocked for glucose biosensing. This work links the electrochemical catalytic properties of PB with the large surface area and mass transport of three-dimensional macro-porous PSF and highlights the importance of interlocking GOD with PB to improve sensor sensitivity and linearity, which also maintains glucose sensor activity. The prepared PB-PSF-GOD glucose biosensor exhibited a 1-12 mM linear range, high affinity and good selectivity with a low applied potential of -0.05 V (vs Ag/AgCl). Furthermore, the prepared sensor only attenuated by 10% after 7 days of continuous testing. The advanced properties of the novel GOD interlocked PB-PSF structure may have promising applications in enzymatic biosensors, especially the continuous glucose monitoring (CGM).

Keywords: Prussian blue; nanostructure; glucose oxidase; glucose biosensor; nanocoating

[FULL TEXT](#)

© 2019 The Authors. Published by ESG (www.electrochemsci.org). This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).