

A Versatile, Porous, Flexible Chitosan Matrix for Enzyme Immobilization in Wearable Sensors

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Abstract

The polymer matrix is vital for enzyme-based glucose sensors due to its immobilization effect on glucose oxidase (GOx), which is important for the structural intactness and stable functionality of this subtle catalyst. Herein, we present a chitosan matrix by a convenient freeze-drying process suitable for GOx immobilization and sensor fabrication. This chitosan matrix endows the enzyme layer with a hierarchically porous structure and thus faster kinetics for glucose penetration and reaction. Moreover, flexibility and conformability of this chitosan matrix is beneficial to the realization of the flexible and wearable glucose sensors. The availability of chitosan matrix has been verified by a skin-like, noninvasive and integrated glucose sensor and other enzyme-based sensors.

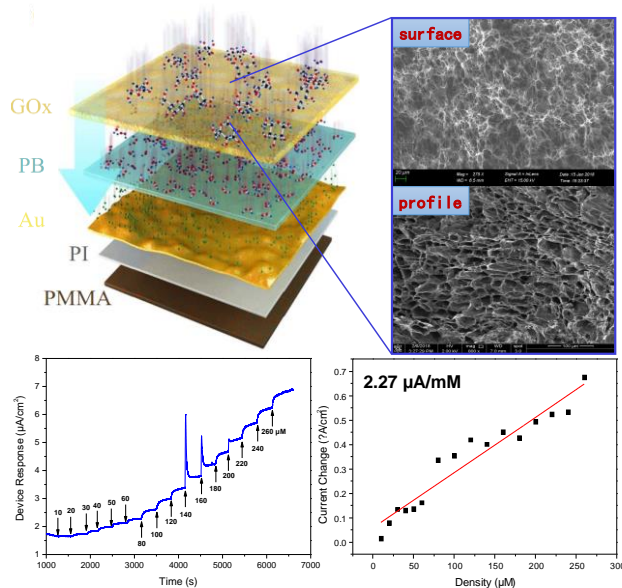


Figure 1: Porous structure of chitosan matrix and corresponding sensor performance.

References

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