

Fabrication of highly sensitive uric acid biosensor based on directly grown ZnO nanosheets on electrode surface

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Here we report the direct synthesis of ZnO nanosheets (ZnO NSs) on the electrode surface by one step low temperature solution process and characterized in detail using various techniques. The directly grown ZnO NSs used for fabrication of uric acid biosensor and performance of fabricated has been examined for uric acid detection. This biosensor showed high sensitivity of $129.81 \mu\text{A cm}^{-2} \text{mM}^{-1}$ in wide-linear range (0.05–2.0 mM) with high R² of 0.9993. A rapid response time of ~5s, low detection limit of 0.019 μM (based on S/N ratio) and lower value of K_{mapp} (0.026 mM) was calculated, which shows a high affinity between the uric acid and uricase immobilized on ZnO NSs. The anti-interference ability, reproducibility and long-term storage stability of biosensor were examined. These results suggests that our fabricated biosensors are highly reproducible, selective and stable for favorable determination of uric acid and can be effectively used for application in real samples with good precision and accuracy.