

# Functionalised zinc oxide nanotube arrays as electrochemical sensors for the selective determination of glucose

## Abstract

In the present study, highly oriented single-crystal zinc oxide nanotube (ZnO-NT) arrays were prepared by a trimming of ZnO nanorods along the c-axis on the gold-coated glass substrate having a diameter of 100-200nm and a length of ~1 $\mu$ m using a low-temperature aqueous chemical growth process. The prepared (ZnO-NT) arrays were further used as electrochemical enzyme-based glucose sensors through immobilisation of glucose oxidase by the physical adsorption method in conjunction with a Nafion coating. The electrochemical response of the sensor was found to be linear over a relatively wide logarithmic concentration range from  $0.5 \times 10^{-6}$  to  $12 \times 10^{-3}$ M. The proposed sensor showed a high sensitivity of 69.12mV/decade with R=0.9934 for sensing of glucose. A fast-response time less than 4s with good selectivity, reproducibility and negligible response to common interferents such as ascorbic acid and uric acid prevailed.