

Colorimetric detection of glucose using a composite entrapping glucose oxidase and cerium oxide nanoparticles immobilized in agarose hydrogel

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In this study, we report a colorimetric biosensor for the determination of glucose using a composite entrapping glucose oxidase (GOx) and cerium oxide nanoparticles co-immobilized in agarose hydrogel. GOx in the composite generates  $H_2O_2$  through its catalytic action for target glucose and subsequently induces the expected color change of cerium oxide nanoparticles. Using this strategy, a highly linear absorbance enhancement was verified when the concentration of glucose was increased in a wide range, which covers the actual range of glucose concentration in human blood. The biosensor is of considerable interest because of its potential for expansion to any oxidases, which will be beneficial for use in practical applications by replacing unstable organic peroxidase with immobilized cerium oxide nanoparticles in an agarose matrix.