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Supplementary information

Reversible sol-gel-sol medium for enzymatic optical biosensors

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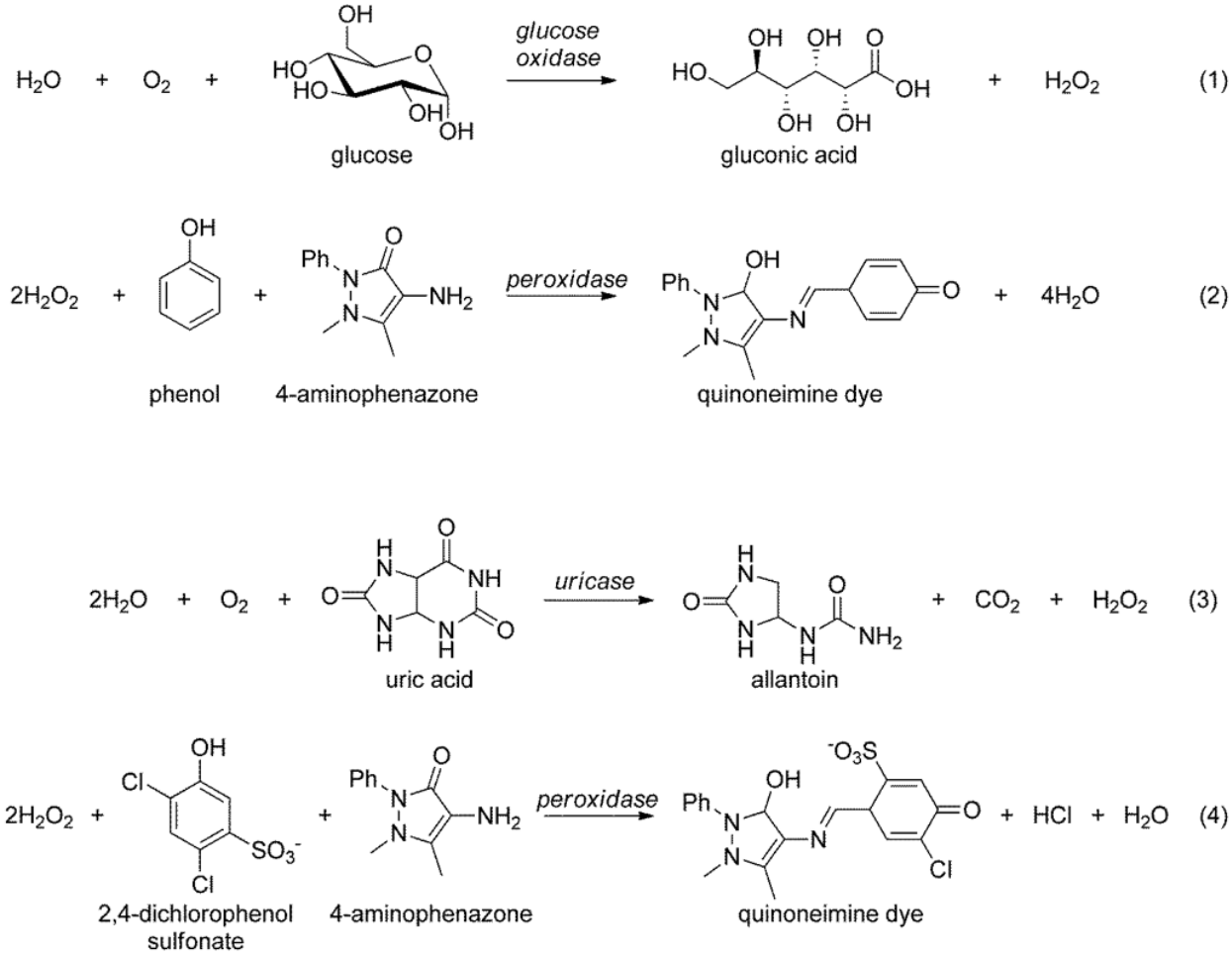
Chemical transformation occurring in biosensors based on oxidases



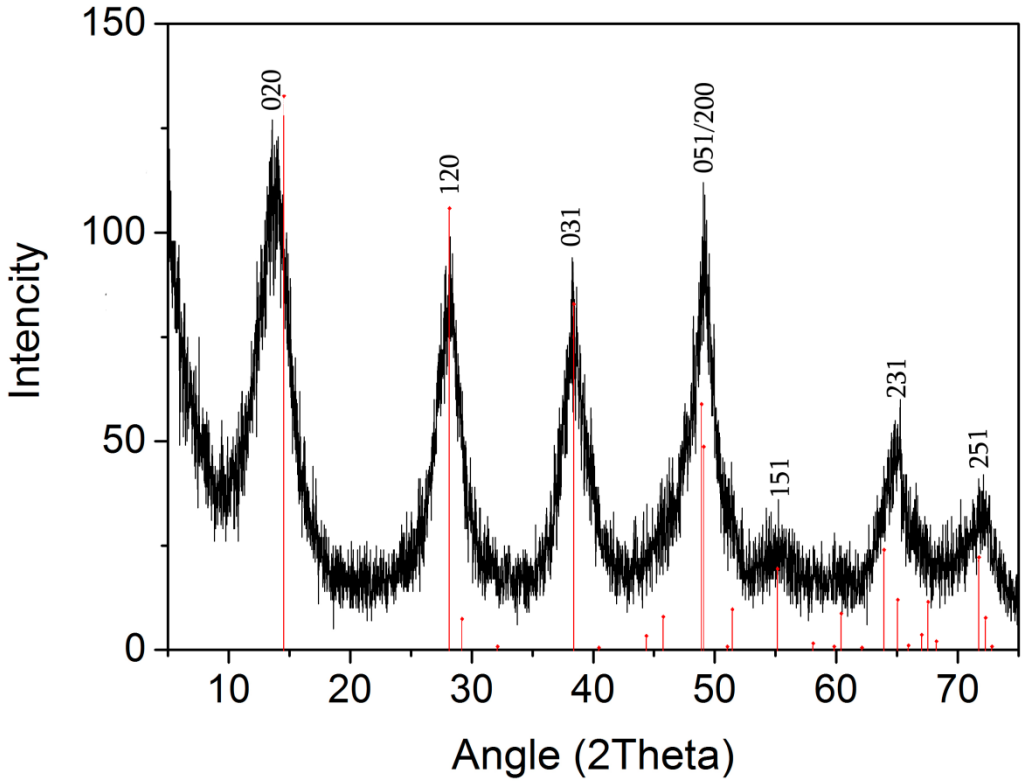


Figure 1S. XRD patterns of an enzymes@alumina. The red lines are the diffraction of the boehmite phase (JCPDS file No. 21-1307).

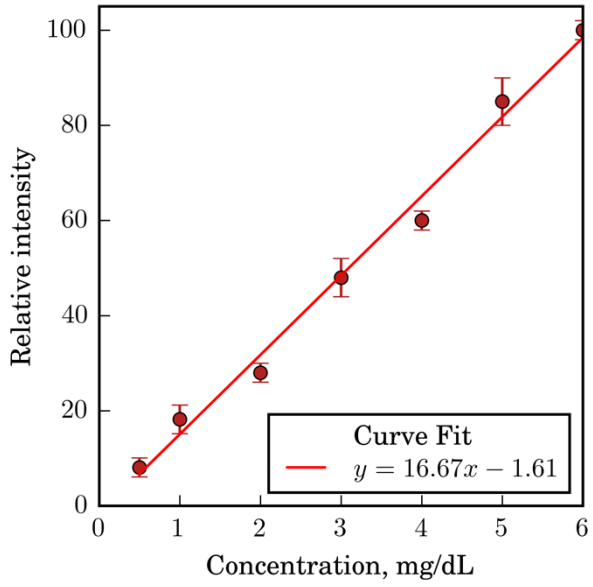


Figure 2S. Uric acid optical response. Relative intensity vs. concentration of uric acid solutions.

Characterization. X-ray diffraction (XRD) measurements were performed on a Bruker D8 Advance using Cu-Kα radiation (λ = 1.54 Å); the samples were scanned at 2θ in the range of 5–75 at a speed of 0.5 degrees per minute. Scanning Electron Microsopy was performed on a

TESCAN VEGA 3. TEM measurements were performed on a FEI Talos F200X, operating at 200kV. AFM measurements were performed on a SOLVER Next Atomic Force Microscopy. Specific surface areas, pore volumes and pore sizes distribution have been determined using the nitrogen adsorption–desorption method. Nitrogen adsorption–desorption experiments were performed at -196 °C on a NOVA 1200e apparatus. The specific surface areas of the samples were calculated by the BET equation. Pore volumes and pore size distributions were calculated using the BJH methods. The spectral analysis of relative enzymatic activity of free and entrapped enzymes was carried out using a Agilent Cary 8454 UV-Vis spectrophotometer. Enzymatic activity of biosensors was measured using a Agilent Cary 60 UV-Vis spectrophotometer by a VideoBarrelino measuring diffuse reflectance consol. Printing process was carried out using Canon PIXMA iP2840 printer with standard PG-445 cartridges. Optical characterization of drops was carried out using LOMO BIOLAM M-1 microscope. Viscosity characteristics of bioinks was measured by Fungilab Expert rotational viscometer.