

Abstract Submitted
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Using Small Angle Neutron Scattering on Glucose Oxidase immobilized on Single Layer Graphene DURGESH RAI, Oak Ridge National Lab, M. GURUSARAN, IISc Bnagalore, S. QIAN, K. WEISS, V. URBAN, Oak Ridge National Lab, P. LI, Harvard Medical School, L. MA, P. AJAYAN, Rice University, T. NARAYANAN, TIFR Hyderabad, K. SEKAR, IISc Bnagalore, S. VISWANATHAN, Newton Wellesley Hospital, V. RENUGOPALAKRISHANAN, Harvard Medical School — Reliable blood glucose monitoring using biosensors is valuable for health evaluations and medication in wake of chronic diabetic issues accompanying deviations from evolutionary human lifestyle. Glucose oxidase (GOx) is an ideal enzyme because of its specificity and the ability to electrochemically transduce from the enzymatic reaction. We use graphene-based electrode with GOx sensor matrix so that the emitted electrons from sensor matrix can flow across graphene nearly without scattering; crucial for constructing ultrasensitive-sensors. Thereafter, establishing a structure-property based relationships to tune the sensor topology with electrochemically output forms the main focus of the device development process. We have developed a methodology to obtain low-resolution hierarchical models of the aggregate matrix using Small Angle Neutron Scattering (SANS) technique. A Unified Fit model is used in tandem with GNOM, DAMMIN and DAMAVER to construct low-resolution models for GOx matrices. A detailed explanation of a general methodology for obtaining quantitative details aggregate structures along with qualitative models will be presented.

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