Flexible and Conductive Films based on Graphene/Nafion Composites for High-Performance Biosensors

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Free-standing reduced graphene oxide (RGO)/Nafion composite films were fabricated by the simple filtration based on the well controlled dispersion of reduced graphene oxide coated with Nafion in bisolvent. The densely well packed (RGO/Nafion) hybrid films with high conductivity (3800 S/m) were used as an advanced composite electrode for application of biosensor. Herein we demonstrated that the hybrid films have the Nerstian and the fast electron transfer reactions and the usefulness of the biosensor with high sensitivity and fast response time. This performance is achieved not only by using the distinct electrochemical properties of the RGO but also more importantly by optimizing the dispersion and interface chemistry assisted with Nafion to create the favorable interfacial area of the RGO contacted with electrolyte.