

ITO Extended Gate Reduced Graphene Oxide Field Effect Transistor For Proton Sensing Application

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In this study, ITO extended gate reduced graphene oxide field effect transistor (rGO FET) was demonstrated as a transducer for a proton sensing application. In this structure, the sensing area is isolated from the active area of the device. Therefore, it is easy to deposit or modify the sensing area without affecting on the device performance. In this case, the ITO extended gate was used as a gate electrode as well as a proton sensing material. The proton sensing properties based on the rGO FET transducer were analyzed. The rGO FET device showed a high stability in the air ambient with a TTC encapsulation layer for months. The device showed an ambipolar characteristic with the Dirac point shift with varying the pH solutions. The sensing characteristics have offered the potential for the ion sensing application.

Keywords: Reduced graphene oxide field effect transistor (rGO FET), Indium tin oxide (ITO), Extended gate FET, Proton sensing