

Humidity sensing characteristic of graphene oxide in low humidity

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Abstract

Graphene oxide has been known for its advantage for sensing water molecules. There are several papers about using graphene oxide as humidity sensor.^{[1],[2]} Graphene oxide shows very fast response and recovery time, and excellent sensitivity. But humidity sensing behavior of graphene oxide in low humidity environment is not yet described. Here, we tested humidity sensing characteristic of graphene oxide, especially in low humidity environment. Electrodes were deposited on substrate by E-beam evaporation and graphene oxide membranes were made by vacuum filtration and stamped on the substrate. We measured resistance between two electrodes with changing humidity environment. When graphene oxide was exposed less than 30% relative humidity, the resistance of graphene oxide increased almost exponentially and finally the resistivity went extremely high. In this presentation, we explain the main mechanism of this reason and suggest the compensating method to sense the low humidity.

References

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- [2] Stefano Borini, Richard White, Di Wei, Michael Astley, Samiul Haque, Elisabetta Spigone, Nadine Harris, Jani Kivioja, and Tapani Ryhanen, *ACS nano*, **12**(2013), 11166-11173.