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Enhanced chemical vapor sensing by single-stranded DNA-graphene

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Sensor platforms lie at the heart of biochemical sensing applications. The efforts, especially for applying functionalized graphene devices have been recently highlighted in the field of biochemical sensors. However, chemical vapor sensors do not guarantee their sensing ability in high humidity since the electrical measurement is easily degraded by water molecules. We are able to overcome this limitation through the use of single stranded DNA as a functionalizing agent. The layer of ssDNA on top of graphene contributes to form another conduction path in high humidity. It is most likely that this additional conduction path provides enhanced sensing capability toward chemical vapors. Since modulation of the graphene channel in terms of electrical resistance and surface affinity depends on the applied ssDNA, the pattern from different responses of various ssDNA-graphene sensors can identify chemical vapors. This characteristic shows great promise for medical diagnostics based on exhaled breath.

Biography

Seong Chan JUN has completed Bachelor, master and Ph.D. degree from George Washington University (Washington D.C.), Cornell University (Ithaca N.Y.), and Columbia University (New York, NY) respectively. After he graduated, he worked at NSEC (Nano Scale Science & Research Center) and SAIT (Samsung Advanced Institute of Technology) sequently. He has been currently appointed professor at Yonsei University (Seoul, Korea) since 2008.

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