

Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Graphene- and graphene oxide- based multisensor arrays for selective gas analysis ALEXEY LIPATOV, Univ of Nebraska - Lincoln, ALEXEY VAREZHNIKOV, VICTOR SYSOEV, Saratov State Technical University, ANDREI KOLMAKOV, Center for Nanoscale Science and Technology NIST, ALEXANDER SINITSKII, Univ of Nebraska - Lincoln — Arrays of nearly identical graphene devices on Si/SiO₂ exhibit a substantial device-to-device variation, even in case of a high-quality chemical vapor deposition (CVD) or mechanically exfoliated graphene. We propose that such device-to-device variation could provide a platform for highly selective multisensor electronic olfactory systems. We fabricated a multielectrode array of CVD graphene devices on a Si/SiO₂ substrate, and demonstrated that the diversity of these devices is sufficient to reliably discriminate different short-chain alcohols: methanol, ethanol and isopropanol. The diversity of graphene devices on Si/SiO₂ could possibly be used to construct multisensor systems trained to recognize other analytes as well. Similar multisensory arrays based on graphene oxide (GO) devices are also capable of discriminating these short-chain alcohols. We will discuss the possibility of chemical modification of GO for further increase the selectivity of GO multisensory arrays.

Alexey Lipatov
Univ of Nebraska - Lincoln

Date submitted: 15 Nov 2013

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