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Effect of Metallic Nanoparticle Decoration on Graphene Oxide Conductivity ELENA GULIANTS, SHIRAL FERNANDO, VENROY WATSON, XIFAN WANG, ELIZABETH GAUGLER, University of Dayton Research Institute, ENERGY TECHNOLOGY AND MATERIALS DIVISION TEAM — Light and strong single-atom-thick carbon derivatives attract a wealth of attention from the research community due to their potential applications. Development of compatible satellite technologies for all-carbon nanoelectronic circuitry is vital for progress in practical applications. Graphene oxide (GO), the closest graphene relative, with its high surface area, unique atomic-layer properties, chemical inertness, and excellent bio-compatibility, has been tested for the applications in energy storage, flexible electronics, sensing technologies, and photovoltaics. GO conductivity enhancement by nanoparticle decoration can drastically improve the field effect transport of charge carriers in thin film transistors. In this study, GO, synthesized using modified Hummer's method, was functionalized with Ag nanoparticles using a two-step sonochemical procedure. Ag nanoparticles were shown to effectively migrate and redistribute when exposed to other carbon allotropies, such as carbon nanotubes and carbon dots. Studies of the effect of Ag precursor concentration and further nanoparticle migration on the conductivity of Ag/GO composites will be discussed within the context of charge carrier transport mechanisms.

Elena Guliants
University of Dayton Research Institute

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