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Colloidal Stability of Graphene Oxide Nanosheets in Aqueous Solutions JANICE WYNN GUIKEMA, Department of Physics and Astronomy, Johns Hopkins University, Baltimore, MD, YUNG-LI WANG, KAI LOON CHEN, Department of Geography and Environmental Engineering, Johns Hopkins University, Baltimore, MD — Carbon-based nanomaterials are increasingly used in commercial products as well as in research and industrial applications. Due to its extraordinary properties, graphene has attracted intense research interest and has been demonstrated in many potential applications including solar cells, conductive ink, and transistors. Graphene oxide has also been studied extensively and has been used to produce biocompatible antibacterial paper. Chemical reduction of graphene oxide is commonly used to produce inexpensive graphene in large quantities. With the increasing use of graphene and graphene oxide in consumer products, these nanomaterials may inevitably be released to aqueous systems, resulting in potential risk to environmental ecosystems and human health. The fate and mobility of graphene and its oxides in aquatic systems is dependent on their colloidal stability. We will discuss our study of the early-stage aggregation kinetics of graphene oxide in aqueous solutions. We prepared a suspension of single-layer graphene oxide nanosheets in water and used time-resolved dynamic light scattering to study the influence of electrolytes and pH on the aggregation kinetics of the nanosheets. Atomic force microscopy was employed to further examine the graphene oxide nanosheets.

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