

Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Restrained Glass transition of Graphene Oxide Colloids with Polymers SO YOUN KIM, YUL HUI SHIM, Ulsan National Institute of Science and Technology, KYUNG EUN LEE, SANG OUK KIM, Korea Advanced Institute of Science and Technology — Graphene and its oxidized form of graphene oxide (GO) have been of particular interest in material science due to their exceptional physical properties. However, relatively little attention has been paid to the GO dispersions although the state of dispersions directly affect to the material property. For example, GO can be well-dispersed in water due to their hydrophilic functionalities; however, they easily form gels or glass around 1 wt%, which often act as an obstacle in GO based composite production. Thus, to understand the structure and dispersing mechanism of GO dispersions is an essential step before reaching application level. In this study, we systematically study the GO dispersion at various conditions and examine how GO glass transition is affected by the presence of polymer. An intriguing observation was that adding polymer can effectively retard glass transition of GO in water. Extensive small angle x-ray scattering and rheological studies are employed to probe the GO structures and properties in solutions.

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Date submitted: 10 Nov 2016

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