

# Dispersion behavior of Graphene Oxide (GO)

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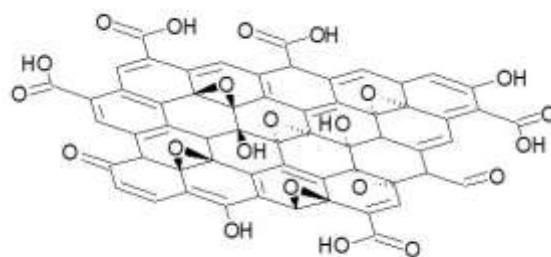
## Abstract

Abalonyx has been extensively active in producing of graphene oxide (GO), reduced graphene oxide (rGO) and other derivatives both in small scale for R&D and larger scales up to 1.1 Kg/day. It has been known several usages for these products in different fields including energy, water treatment, nanostructure materials, and coatings. For some of these applications, pH adjustment can be needed. Abalonyx graphene oxide is used to study the effect of different parameters on graphene oxide suspension including organic/ aqueous solvent, acidity/ basicity, aging, sonication frequency, bath time and temperature, as well as the effect of light on the selected graphene oxide samples. Graphene oxide (GO) as prepared by the "Hummers method" is a solid acid with up to 2 mmol acid sites per gram. The acid sites are of various nature, but mostly carboxylic and hydroxylic groups (Fig.1) The results showed well-dispersion and long-term stability of GO samples in deionized water both at low and high PH which also have been confirmed previously [1-3]. It was also found that graphene oxide can be reduced by light and became darker. Titration curves for "standard" GO and "water washed" GO are shown in Fig. 2, the standard GO having about 1.4 mmol acid sites per gram and the water washed GO having about 0.4 mmol acid sites per gram.

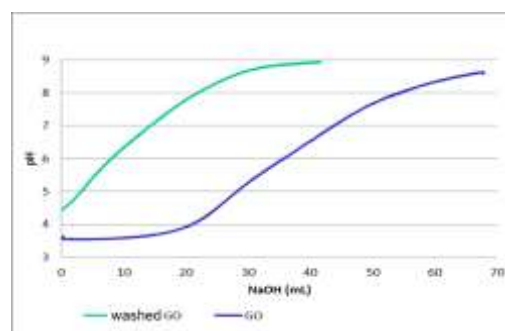
## References

- [1] J. I. Paredes, S. Villar-Rodil, A. Martinez-Alonso, and J. M. D. Tascon, *Langmuir*, 24, 10560-10564, (2008)
- [2] Haining Wang, Sian Chen, Shanfu Lu, and Yan Xiang, *Chemical Physics Letters*, 676, 129-133, (2017)
- [3] Konios D, Stylianakis MM, Stratakis E, Kymakis E, *J Colloid Interface Sci.*, 430, 108-112, (2014)

## Figures



**Figure 1:** Schematic illustration of functional groups on GO



**Figure 2:** Titration curves for as produced GO compared to water-washed GO, 0.025 % dispersions titrated with NaOH.