

# Derivatives of Graphene Oxide for different target applications

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## Abstract

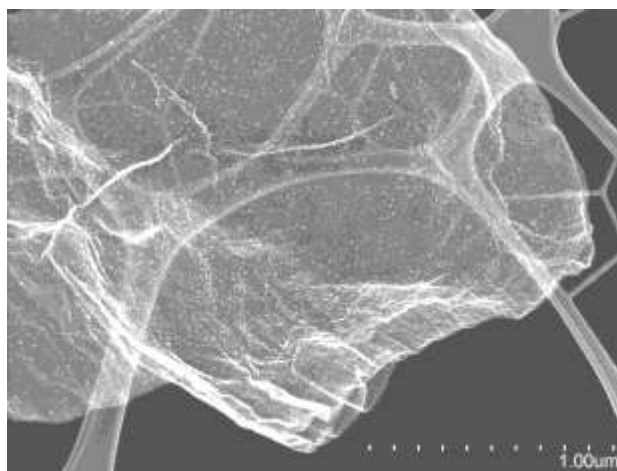
Graphene oxide is a very versatile material that can be modified in a range of ways, for example by deposition of metals and metal oxide nanoparticles on the surface. This makes it a candidate for as diverse applications as energy storage in batteries, supercapacitors, fuel cell membrane, solar cells and CO<sub>2</sub>-capture [1, 2], water treatment [3], functional coatings, including anti-corrosion, anti-fouling and anti-bacterial coatings [4], wearable electronics and sensors [5], biomedical [6] as well as catalytic processes [7]. The combination of graphene oxide with TiO<sub>2</sub> nanoparticles (Fig. 1) from our lab shown as examples.

Unfortunately, most studies are performed on “home”-produced lab-scale graphene oxide, limiting the value of the results since it is not known exactly how similar samples from different labs are. We strongly recommend the graphene community to follow the practice of the Clay Mineral Society have a repository of well homogenized and fully characterized materials that are distributed to labs world-wide at low cost [8].

## REFERENCES

- [1] U.R. Farooqui, A.L. Ahmad, N.A. Hamid, Renewable and Sustainable Energy Reviews, 82, 1, 2018, 714-733.
- [2] B. Li, H. Cao, J. Shao, M. Qu, J. H. Warner, J. Mater. Chem. 2011, 21, 5069–5075.
- [3] V. Chandra, J. Park, Y. Chun, J. W. Lee, I. C. Hwang, K. S. Kim, ACS Nano 2010, 4, 3979–3986.
- [4] C.H. Deng, J.L. Gong, G.M. Zeng, C.G. Niu, Q.Y. Niu, W. Zhang, H.Y. Liu, J. Hazardous Mater. 2014, 276, 66–76.
- [5] Wei Han, Zhineng Wu, Yao Li, Yingying Wang, Chem. Eng. J., 358, 2019, 1022-1037.
- [6] S. Bandi, V. Hastak, C.L. Pavithra, S. Kashyap, D.K. Singh, S. Luqman, A.K. Srivastav, J.Mater. Res, 2019, 34(20), 3389-3399.
- [7] J. Hu, Y. Wang, M. Han, Y. Zhou, X. Jiang, P. Sun, Catal. Sci. Technol. 2012,2, 2332–2340.
- [8] [http://www.clays.org/sourceclays\\_history.html](http://www.clays.org/sourceclays_history.html)

## FIGURES



**Figure 1:** Abalonyx graphene oxide decorated with TiO<sub>2</sub> nanoparticles.