

Graphene Oxide and Reduced Graphene Oxide, Up-coming Applications

Rune Wendelbo

Stephanie H. Santos, Siamak Eqtesadi and Azadeh Motealleh

Abalonyx AS, Forskningsveien 1, 0373 Oslo, Norway

rw@abalonyx.no

Abstract

Graphene oxide, GO, and its derivative rGO are by definition single, partly oxidized graphene sheet with C/O-ratio around 2 for GO and typically between 5 and 100 for rGO. Both conductivity and hydrophobicity increases with increasing C/O-ratio. A range of applications for these materials are now being developed in R&D-labs around the globe, in diverse fields of technology, including water de-salination and purification, sensors, load-speaker membranes, batteries and super-caps, polymer and ceramic composites, coatings, conducting films and more. The supply of GO and rGO will critically depend on production scalability. Abalonyx has developed a proprietary production method for GO eliminating the risk of thermal run-away associated with the "Hummers method" [1]. Recently we have also developed a tunable process for thermal reduction of GO to rGO, as well as pillared rGO (Fig 1) and bioglass/rGO ink for 3D-printing of e.g. scaffolds [2] (Fig 2).

References

- [1] W. Hummers and R. Offemann, JACS 80, 6 (1958) 1339
- [2] S. Eqtesadi et al, J. Eur. Ceram. Soc, 2017 online: <http://www.sciencedirect.com/science/article/pii/S0955221916307002?np=y>

Figures

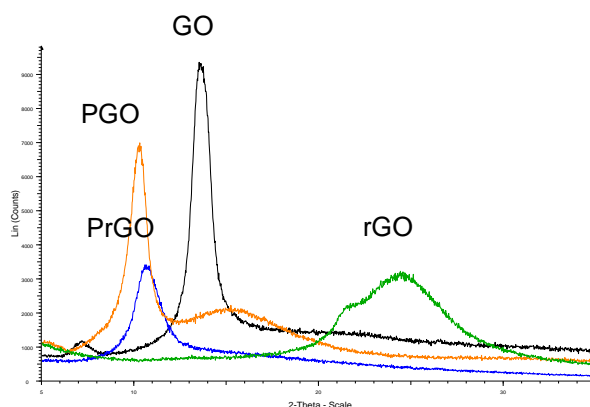


Figure 1: X-ray diffractograms of non-pillared GO and rGO and pillared PGO and PrGO

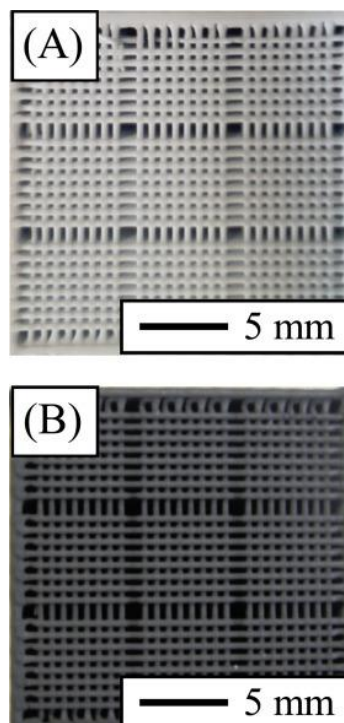


Figure 2: Bioglass (A) and bioglass/rGO (B) scaffolds prepared by Abalonyx team.