Mass production of 2D nanocarbons

Yuta Nishina
Okayama University
nisina-y@cc.okayama-u.ac.jp

Exfoliation of graphite through oxidation is a promising technique to produce two-dimensional nanocarbons on a large scale. We have achieved a 500 g scale production of graphene oxide in laboratory, and now the scale is increasing to 10 kg. The large-scale production was achieved by the mechanistic study of the oxidation process using in situ analyses, such as XRD and XANES analyses. Our optimized graphene oxide production processes enabled the control of the size, oxidation degree, and functional group distributions on graphene. We also developed a method for the non-destructive oxidation of graphite using the specially designed electrolyte. It is confirmed that the choice of solvents and electrochemical conditions enabled excellent control over the functionalization degree and type of functional groups on graphene.

References

[1] N. Morimoto, Y. Nishina, et al, Chem. Mater, 46 (2017) 4160.