SEMINARIUM RENTGENOWSKIE

Dnia 05.11.2013r. o godz. 10.30, w Sali D Instytutu Fizyki PAN, odbędzie się seminarium rtg. na którym **Dr Ana Sanchez z University of Warwick**, wygłosi referat na temat:

"A novel approach to high contrast electron microscopy of macromolecular block copolymer assemblies at sub-nanometricscale"

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Macromolecular block copolymers can self-assemble into a wide range of 3D morphologies. A precise description of their size and morphology is critical for understanding their function and therefore develop their applications. Although transmission electron microscopy (TEM) is widely used to analyse these structures, the scattering from light elements is very weak. This leads to very low contrast when this type of specimen is examined upon a conventional support film such as amorphous carbon or formvar. A common approach is to stain the specimen with a heavy element, but this technique may affect the morphology and lead to misleading artefacts.

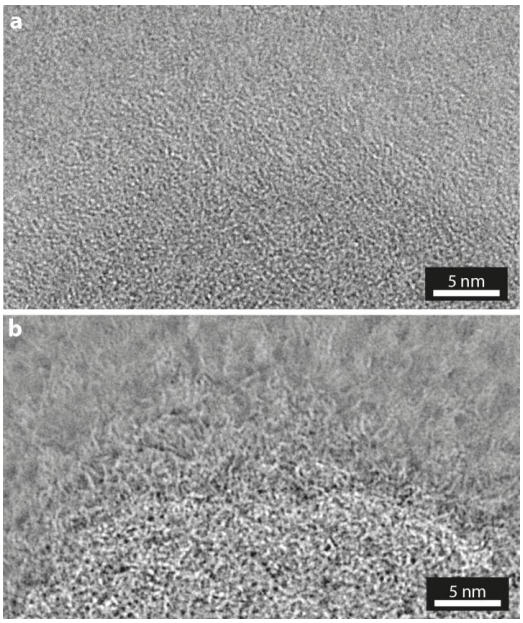

Fig. 1 Comparison of conventional TEM imaging and EWR phase imaging. (a) near focus TEM, and (b) EWR phase.

Large areas of graphene oxide (GO) are very easy to prepare by drop casting methods. TEM grids based on GO provide a robust and ultra-low contrast support at very low cost in comparison with graphene, eliminating the need to use stains for light materials. Remarkable improvements on the contrast and resolution of TEM imaging in soft matter have been recently achieved in our lab. GO supports have been used for high contrast multi-technique imaging to characterise block copolymer assemblies[1]. We have developed a routine for high contrast imaging of light materials at sub-nanometric scale without the need for staining. The technique isbased on exit wave reconstruction (EWR) in combination with low-contrast support can be implemented without additional hardware in TEM microscopes. This novel approach not only allows the morphology of the assemblies to be characterised, but also provides an insight into the substructure (i.e. the polymer chains)[2] as can be observed in Figure 1.

[1]J.P. Patterson, A.M. Sanchez, et al. *Soft Matter*, 2012, **8**, 3322
[2]M.A. Dyson, A.M. Sanchez, et al. *Soft Matter*, 2013, **9**, 3741

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