



New Rigaku SmartLab® XRD system installed at the Henry Royce Institute at The University of Manchester

Henry Royce Institute | www.royce.ac.uk
Rigaku SmartLab | <https://www.rigaku.com/en/products/xrd/smartlab>

Rigaku and *Scientific and Medical Products (SciMed)* are proud to announce the installation of a new [Rigaku SmartLab](#) system within the [National Graphene Institute](#) at The University of Manchester ([UoM](#)) as part of the leading advanced materials work being carried out on campus.

Research in this area will become part of the activity to support the [Henry Royce Institute](#), which will have its hub based in Manchester. The Institute will lead the accelerated discovery and development of new materials systems for the economic and social benefit of the UK. The key theme within the Institute will be the application of 2D Materials, in collaboration with the National Graphene Institute, an area pioneered in the UK, and one where the UK has a lead in the terms of the fundamental physics of such materials.

In this facility, the University will provide the users, from the University, from the Royce partners, other academic groups in the UK, and companies investing in the production and use of 2D Materials an easy access to the accelerated make-evaluate-refine loop leading to faster optimization and delivery of new materials, using the rapid screening of the thin films formed from the 2D Materials.

The most efficient and rapid way of achieving this is through the use of X-ray diffraction, using X-ray diffractometers suitable for investigating structures of nm-thin films. The SmartLab XRD system will allow investigation in the in-plane and out-of-plane crystalline structures of thin films, laminates and membranes (e.g., graphene or graphene oxide membranes) at various conditions such as different temperatures and different solution or solvent environments.

The understanding of the membrane structure at various conditions is crucial for the optimisation of membrane design for various applications. For example, the inter-layer structure of graphene oxide membrane changes drastically with exposure to different aqueous solutions and this property allow us to tune the graphene capillaries in the graphene oxide membranes. This SmartLab XRD system will be critical for the characterisation and functionalization of solution-processed large area 2D Materials van der Waals heterostructures and films for various applications such as photovoltaic, sensors etc, which are in the focus of Royce Institute partners, the universities of Cambridge and Manchester.

Darren Machen, XRD Product Manager at SciMed enthused, “SciMed are very proud of the recent installation at the National Graphene Institute. The research carried out at the NGI is very high profile and has caught the imagination of the general public. The new SmartLab is a very comprehensive system so will allow the researchers to perform complex material investigations. SciMed look forward to supporting the work at the University of Manchester and seeing the world class research published.”