

THE UNIVERSITY OF MANCHESTER

PARTICULARS OF APPOINTMENT

FACULTY OF SCIENCE & ENGINEERING

SCHOOL OF NATURAL SCIENCES

DEPARTMENT OF MATERIALS

RESEARCH ASSOCIATE IN THE 2D-ELASTOMER NANOCOMPOSITES

VACANCY REF: SAE-022521

Salary:	Grade 6, £35,308 to £43,155 per annum, depending on relevant experience
Hours:	1 FTE
Duration:	Fixed term for 24 months
Location:	Oxford Road, Manchester

Enquiries about the vacancy, shortlisting and interviews:

Name: Professor Ian Kinloch or Dr Mark Bissett

Email: ian.kinloch@manchester.ac.uk or mark.bissett@manchester.ac.uk

Background

A Postdoctoral Research Associate (PDRA) position is available for an outstanding and ambitious materials scientist to undertake research in the graphene nanocomposite for sealing technology.

Overall Purpose of the Job

A Postdoctoral Research Associate (PDRA) position is available for an outstanding and ambitious materials scientist to undertake research in graphene-elastomer composites. The position will be held in the Advanced Nanomaterials Group and is funded by the RIC-2D Centre (<https://www.ku.ac.ae/ric-2d/>) in collaboration with Khalifa University in UAE. Your role will be studying multifunctional, graphene-composites as barriers against industrial gases and chemicals. Typically, these seals are produced using fluoroelastomers which are facing an uncertain future due to restrictions on polyfluoroalkyl substances. Hence, you will be using 2D materials to uplift the performance of common polymers to produce a new generation of fluorine-free seals.

You will be collaborating with scientists in Khalifa University, including hosting their visits to Manchester and visiting their laboratories. In addition to developing new technology, you will be studying the underlying science and publishing it in high quality articles.

You will have experience in the elastomeric materials and competence in measuring their microstructure and their physical and barrier properties. Preferable you will also have experience

in alternative thermoplastic sealing technologies. You should be able to maintain a high degree of accuracy, and to write and present your work both internally and for wider dissemination. You should have a PhD in Materials Science, Chemistry, Physics or a related discipline and an excellent publication track record. You will be part of a well-established and world leading team working on graphene, and other 2D materials, across the faculty, National Graphene Institute and Henry Royce Institute.

Key Responsibilities, Accountabilities or Duties

- Produce and characterise the microstructure of the graphene composite materials.
- Characterise the microstructure of the graphene composite materials.
- Produce models to describe the microstructure-property relationships.
- Interact with and visit academic and industrial collaborator laboratories and research facilities. In particular, collaborate with the other partners in the RIC-2D project.
- Visit the laboratories at Khalifa University, UAE.
- Support the visit of researchers from Khalifa University to the University of Manchester.
- Deal with routine communication using a range of media.
- Communicate complex information, orally, in writing and electronically.
- Communicate material of a specialist or highly technical nature.
- Conduct both individual and collaborative research.
- Write up research results for publication and dissemination.
- Continually update knowledge and understanding in field or specialism.
- Build internal contacts and participate in internal networks for the exchange of information and to form relationships for future collaboration.
- Join external networks including the industrial collaborators to share information and identify potential sources of funds.
- Contribute to collaborative decision making with colleagues in areas of research.
- Use research resources, laboratories and workshops as appropriate.
- Plan and manage own research activity in collaboration with others.
- Balance with help the competing pressures of research and administrative demands and deadlines.
- Be aware of the risks in the work environment and their potential impact on their own work and that of others.

Person Specification

Essential Knowledge, Skills and Experience:

- A Ph.D. in materials science, chemistry or a related discipline.
- Skilled in a variety of elastomer composite production and characterisation techniques.
- Skilled in the measurement of barrier properties of composites.
- An ability to communicate complex ideas and arguments both in written form and orally.
- Good communication and interpersonal skills and proven time management and organisational skills.
- Ability to work independently
- Ability to collaborate with international project partners.
- Ability to produce a good first draft of a journal article.
- Good IT skills, ability to use statistical analysis software competently.

- Good publication track record.

Desirable Knowledge, Skills and Experience:

- Experience in working with 2D materials (e.g. graphene, boron nitride, MoS₂ etc.).
- Experience in SEM (including EDX and EBSD), TEM, Raman spectroscopy, XRD and analysis of XPS data.
- Experience in alternative sealing materials, such as high molecular weight thermoplastics.