



Job title	Postdoctoral Research Fellow (Chemical Synthesis, Formulation and Characterisation)	Job family and level	Research & Teaching Level 4
School/ Department	Faculty of Engineering	Location	University Park Campus

Purpose of role

This Postdoctoral Research Fellow position (PDRA) is part of an EPSRC funded Prosperity Partnership project. A novel class of polymers are being developed and synthesised in the labs of Croda Ltd, and Nottingham, which show great promise in reducing the environmental footprints of Polymer Liquid Formulations (PLF) used in personal care products. We recently added the use of a new range of monomers and oligomers (small polymers) to provide improved and controllable degradation performance from PLF formulations. These are being developed in this project to reduce the polymer burden that results from personal care products, such as shampoos and soaps.

This post will employ polymer synthesis and characterisation to deliver the up-scaled manufacture of the polymers and to aid in the development of their formulation, also at the larger scale. Degradation testing will be conducted to estimate the degradation performance of the new polymer, both on their own and as part of a blended PLF formulation. This may include the development of high-performance polymeric materials which also deliver the desired surface functionality to fulfil their end-use application e.g. cleaning, thickening or surface coating. The role holder will work very closely with collaborative researchers who specialise in surface chemical and material property analysis and those conducting the degradation tests to confirm that the target functionality have imparted the correct level of biodegradability. There will also be a need for the generation and interpretation of advanced characterisation data such as, Gell Permeation Chromatography (GPC), Nuclear magnetic resonance spectroscopy (NMR), ToF and OrbiTrap Secondary ion mass spectrometry (SIMS), X-ray photoelectron spectroscopy (XPS), atomic force microscopy (AFM) and Raman/Infra-Red spectroscopy.

The successful candidate will be responsible for the synthetic monomer synthesis, polymerisation experimentation, molecular characterisation and formulation of these products into PLFs. They will collaborate with other researcher to integrate their output into both in collaboration with the other PDRAs/PhDs at Nottingham, PDRAs/PhDs at York University and members of the research staff at Croda Ltd. They will be required to integrate their results with the data analysis programmes with support from machine learning experts within the project. There are also links to research groups that are based at York University who are also part of the larger project focusing on sustainable monomer synthesis.

This is a collaborative project between the Faculty of Engineering and the School of Chemistry. This full-time post will be offered on a fixed-term contract for a period of 18 months; starting in October half of 2026.

We pride ourselves on the collegial and supportive culture created by our staff. We are dedicated to creating an environment which enables both our staff to thrive and achieve their potential. Our commitment to Equality and Diversity has been recognised in the awarding of an [Athena SWAN Silver Award](#).

	Main responsibilities	% time per year
1	▪ To design and develop novel polymers with the correct molecular structure for formulation into processing solutions for device preparation. ▪ To optimise the designed polymer processing formulations into scale-up processes sufficient to create devices to satisfy the overall projects demand. ▪ To design and build, in collaboration with the workshop/glass blower, scale-up apparatus for polymer/PLF Formulation processing. ▪ To develop understanding about the polymer/PLF formulation material performance, in collaboration with the internal project collaborators based on their material testing data. ▪ Contribute to the interpretation of the spectroscopic/application data. ▪ Contribute to the formulation processing and degradation assessment method development. ▪ Liaise with the project's external collaborators and sponsors on the polymer chemistry and formulation development.	55%
2	▪ Lead and make significant contributions to scientific publications.	15%
3	▪ Presentation of results at internal and external meetings.	10%
4	▪ Maintenance of lab equipment and training of other researchers and students in the safe use of the equipment.	5%
5	• Assistance in the supervision of undergraduate and postgraduate students.	5%
6	• Organisation and assistance in general laboratory duties such as ordering of reagents, equipment maintenance, and laboratory housekeeping.	5%
7	• Active contribution to group meetings by e.g. problem solving, suggestions, <i>etc.</i>	5%

Person specification

	Essential	Desirable
Skills	• A background in chemistry and/or manufacturing monomers or polymers and preferably experience in synthetic polymer chemistry. • Relevant materials characterisation (e.g. NMR, MALDI, XRD, SEM, AFM, XPS, FTIR, GPC/MALLS, etc.). • Experience in spectroscopic analysis of polymeric material molecular architectures synthesised via controlled polymerisation and polymer formulations created via blending • Excellent oral and written communication skills including the ability to communicate complex information with clarity. • Problem solving skills. • Ability to work independently and as part of a team. • Flexible, proactive and dedicated approach.	▪ Experience in formulating monomeric and polymeric materials ▪ Experience in rheology and contact angle measurements
Knowledge and experience	▪ Experience with polymer and material analysis data acquisition and interpretation. ▪ Present work effectively to a variety of professional and academic audiences at meetings and conferences. ▪ Write high quality reports and papers for publication.	▪ First author publications in the highest impact factor journals.
Qualifications, certification and training (relevant to role)	▪ A first degree in Chemistry, Materials, Pharmacy, Physics, Engineering, or related discipline. ▪ PhD (or be about to obtain) or equivalent in Physics, Chemistry Chemical Engineering or similar Science / Engineering degree.	



Expectations and behaviours

The University has developed a clear set of core expectations and behaviours that our people should be demonstrating in their work, and as ambassadors of the University's strategy, vision and values. The following are essential to the role:

Valuing people	Is always equitable and fair and works with integrity. Proactively looks for ways to develop the team and is comfortable providing clarity by explaining the rationale behind decisions.
Taking ownership	Is highly self-aware, looking for ways to improve, both taking on board and offering constructive feedback. Inspires others to take accountability for their own areas.
Forward thinking	Driven to question the status quo and explore new ideas, supporting the team to "lead the way" in terms of know-how and learning.
Professional pride	Sets the bar high with quality systems and control measures in place. Demands high standards of others identifying and addressing any gaps to enhance the overall performance.
Always inclusive	Ensures accessibility to the wider community, actively encouraging inclusion and seeking to involve others. Ensures others always consider the wider context when sharing information making full use of networks and connections.

Key relationships with others



