

Candidate Information

Position:	Research Fellows
School/Department:	School of Chemistry and Chemical Engineering
Reference:	23/111483
Closing Date:	Monday 8 January 2024
Salary:	£37,841 per annum
Anticipated Interview Date:	Tuesday 23 January 2024
Duration:	12 months or available until 31 March 2025, whichever is sooner

JOB PURPOSE:

The School of Chemistry and Chemical Engineering at Queen's University Belfast, is currently seeking to appoint highly motivated and enthusiastic candidates to the post of Research Fellows on the project Integrated capture and conversion of CO₂ to fuels, funded by Centre for Advances in Sustainable Energy (CASE); Green Innovation Challenge Fund. The consortium aims to design new catalysts and chemical processes for biochar production and direct capture and conversion of CO₂ to fuels such as methanol and methane to facilitate decarbonisation and accelerate our ambition to Net zero emissions targets. This is a fantastic opportunity for the researchers to work within a vibrant multidisciplinary catalysis lab. The research fellow will liaise with colleagues from Chemistry and Chemical Engineering as well as interact on regular basis with our collaborators from refinery and renewable energy companies.

MAJOR DUTIES:

1. To optimise the process for biochar production from digestate and waste brewer's grains, process optimisation using Aspen Plus and detailed techno-economic assessment.
2. To prepare heterogeneous catalysts and evaluate these systems for hydrogenation of CO₂ to methanol and hydrocarbons using custom built packed-bed reactors.
3. To work with the consortium collaborators. Participate in the development of the research strategy within the research group.
4. Normal duties will apply, including the preparation of reports, presentations and research/journal papers and assisting in supervision of PhD/MEng students.
5. Develop and plan an area of personal research and expertise, and/or undertake research under supervision within a specific research project or as a member of a research team.
6. Design, develop and refine experimental apparatus, field research or experiments to obtain reliable data.
7. Carry out analyses, critical evaluations, and interpretations using methodologies and other techniques appropriate to area of research.
8. Present regular progress reports on research to members of the research group or to external audiences to disseminate and publicise research findings.
9. Prepare, often in consultation with supervisor, material for publication in national and international journals and presentations at international conferences.
10. Assist grant holder in the preparation of funding proposals and applications to external bodies.
11. Carry out routine administrative tasks associated with the research project/s to ensure that project/s are completed on time and within budget. These might include organisation of project meetings and documentation, financial control, risk assessment of research activities.
12. Carry out occasional undergraduate supervision, demonstrating or lecturing duties within the post holder's area of expertise and under the direct guidance of a member of academic staff.
13. Read academic papers, journals and textbooks to keep abreast of developments in own specialism and related disciplines.

ESSENTIAL CRITERIA:

1. Normally have obtained or be about to obtain a PhD in Chemistry or Chemical Engineering (NB 'About to obtain' is normally defined as within 3 months of application date).

2. Specific, relevant research experience to include:
 - Hands on experience in gas/vapour phase reactions using fixed-bed reactors at postgraduate or postdoctoral level.
 - Ability to design, construct and refine the experimental rig using pumps, mass flow controllers and back-pressure regulators.
 - Ability to work effectively within a team, particularly with a technology company.
 - Be prepared to supervise and interact with PhD and Masters students.
 - Strong publication record commensurate with stage of career.
3. Ability to contribute to broader management and administrative processes.
4. Contribute to the School's outreach programme by links with industry, community groups etc.
5. Practical problem solving skills, independence of thought and initiative.
6. Demonstrable ability to meet deadlines.
7. Ability to assess and organise resources.
8. Organised and attentive to detail.
9. Ability to communicate complex information in English effectively in oral and written format.
10. Ability to build relationships to develop internal and external networks.
11. Commitment to continuous professional development.
12. Dedicated to the completion of a project.
13. Willingness to travel and work in other locations in the UK.
14. Willingness to work for periods in other laboratories including industrial laboratories.

DESIRABLE CRITERIA:

1. Experimental experience of catalytic hydrogenation of CO₂ and biochar production including process optimisation using Aspen plus, catalyst synthesis, characterisation and analytical methods.
2. Experience in use and operation of continuous flow reactors and in-line reaction monitoring techniques.

ADDITIONAL INFORMATION:

The project will be undertaken within the multi-disciplinary Catalysis lab at QUB.

This is a unique opportunity for a dynamic and ambitious catalytic researcher with experience in packed-bed reactors for gas-phase reactions, heterogeneous catalysis, and bio-refinery processes to work in a leading and reputed centre of catalysis. The successful candidate will develop and optimise processes for biochar production and hydrogenation of CO₂ to methanol and methane. In addition, the researcher will work with the collaborators to design and scale up the process. The successful candidate will have the opportunity to work within a highly driven multi-disciplinary team of scientists, engineers from academia and industry, and benefit from a strong research-intensive collaborative network.

We are offering generous terms and conditions of employment, a wide range of benefits and facilities, in a family friendly working environment. Belfast is one of Europe's most friendly and fashionable regional capitals. Referred to as a 'treasure with an incredible atmosphere' (National Geographic Traveller), Belfast is reported to be the second safest city in the world (United Nations). With the lowest cost of living in the UK (Mercer.com 2014), Belfast offers a variety of cultural, sporting, educational and social opportunities.

Our University has established itself as the leading university for promoting good employment practice for its female staff and has been involved with the Athena SWAN initiative from its inception. Queen's was one of the first of two universities to be recognised with an institutional Silver award in 2007, and all of our SET Schools currently hold SWAN awards at Silver level or above. We are an equal opportunities employer and welcome applications from all sections of society we particularly welcome applications from suitably qualified women as there is an under-representation of females in this subject area.