

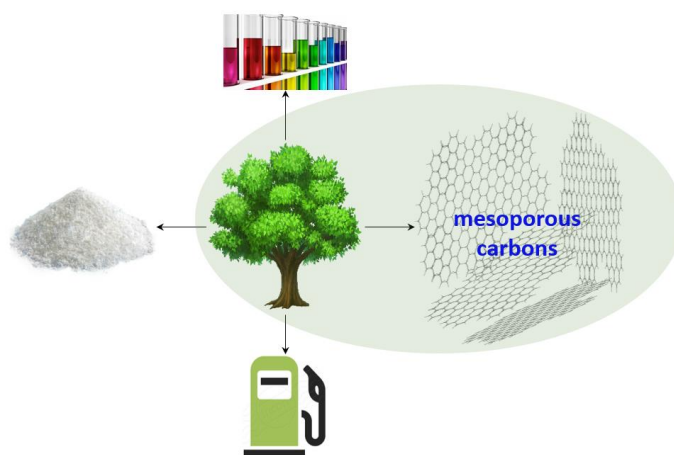
QUB-CSC Scholarship PhD Project Proposal 2018-2019

Title: Thermochemical Conversion of Lignin into Mesoporous Carbon Materials

Keywords: Bioenergy, lignin, mesoporous carbon, sustainability

Project Description:

There is a national and global imperative to reduce reliance upon fossil fuels and, at the same time, to improve the efficiency of natural and renewable resources utilisation. These societal demands for 'green energy' and sustainability come together with a need for local and value-added manufacturing and are encapsulated in the Engineering Grand Challenge of efficiently converting biomass waste into valuable materials. This multidisciplinary project will address this challenge with a particular emphasis on utilising the lignin component of the feedstock for mesoporous carbons with specific pore structures aiming for industrial applications.



Both multi-scale simulations (quantum chemistry, system modelling, techno-economic analysis) and experimental validation for the converting process will be carried out. The applicant will work closely with collaborators from both **industry and academia** within **UK and abroad (China)**. The student will be expected to participate in relevant **national and international conferences**, and develop journal papers within the research field.

Queen's University Belfast is a member of the Russell Group (the UK's leading research-intensive universities) and was ranked 8th (out of 154 UK Universities) in terms of Research Intensity in REF 2014. Of the research output from the School of Mechanical and Aerospace Engineering, 88% was rated as 'internationally excellent' or 'world-leading'. The student may expect to build his/her career in the area of sustainable energy by working closely with the research staff of QUB.

Key Skills Required for the post:

Applications are invited from candidates who have achieved, or expect, a first class or upper second class honours in Renewable Energy / Computational Chemistry / Chemical Engineering, or an equivalent qualification at Masters level. Candidates need to demonstrate of high motivation and strong communication skills (written and oral), work in a team and undertake challenging tasks using their own initiative.

Key Transferable Skills that will be developed during the PhD:

Key skills will be developed in the following:

- Engineering process simulation;

	<ul style="list-style-type: none">• Atomic/molecular simulation on mechanism and kinetics;• Experimental validation techniques;• Study experience in other institutes and companies within the UK and in China.
First/Lead Supervisor and their contact details	Dr Xiaolei Zhang (Lecturer, Clean Energies, SMAE, QUB) Tel: +44 (0)28 9097 4490, Email: xiaolei.zhang@qub.ac.uk
Second Supervisor and their contact details:	Dr Peter Nockemann (Senior Lecturer, Inorganic and Materials Chemistry, QUB) Tel: +44 (0)28 9097 4475, Email: p.nockemann@qub.ac.uk