

SEMINAR SERIES

HIGHLIGHTS IN ENERGY RESEARCH

29.11.2018, 16:00 - 17:00, EPFL Valais, 4th floor, ZEUZIER room

Novel porous materials for CO₂ capture applications

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Host : Prof. Berend Smit

The UK Government has an ambitious target to reduce CO₂ emissions by 80% by 2050, where Carbon Capture and Storage (CCS) together with bioenergy are critical for the UK to meet its reduction targets, whilst delivering affordable, secure and sustainable energy. However, significant challenges remain in growing CCS from the megaton level on CO₂ emissions reductions, where it is today, to the gigaton level where it needs to be to help mitigate global climate change. These challenges include the efficiency and capital cost penalties associated with CO₂ capture, which are hindering the deployment of CCS. The advancement of sorption-based technologies for capturing CO₂ from power plants and large industrial facilities has attracted a lot of interest in recent years. Some of the main advantages of a sorption-based process over the conventional amine scrubbing process include low regeneration energy requirements, no liquid waste and a much wider range of possible operating temperature (typically ranging from ambient temperature to 700°C).

In the past few years, our group has engaged in the development of novel solid sorbents for CO₂ capture with superior performance and desirable economics. This seminar will provide an overview of our research – past and current – in that field. I will present selected examples of our work, where our group's approach encompasses not only materials synthesis but also characterization, lab-scale performance testing, process intensification and process modelling including process integration and optimisation. By establishing the materials composition-structure-performance relationship and by anticipating the required process performance, we can ultimately provide guidance for the development of more advanced, next-generation materials for cost-competitive and efficient separation processes in energy, industrial and environmental applications.



Dr. Susana García is Assistant Professor in the Institute of Mechanical, Process and Energy Engineering at Heriot-Watt University, which she joined in May 2014. She is currently the Associate Director in Carbon Capture and Storage at the Research Centre for Carbon Solutions (RCCS), an interdisciplinary world leading engineering centre, inspiring and delivering innovation for the wider deployment of technologies needed to meet necessary carbon targets. Prior to this appointment, she was a post-doctoral research member at the Spanish National Coal Research Institute (INCAR-CSIC), where her research work was focused on CO₂ capture with carbon-based solid sorbents. She received her PhD in Chemical Engineering from the University of Nottingham in 2010 and her PhD research focus was on injection of CO₂-SO₂ mixtures in geological formations for CO₂ storage. Her current research focuses on advancing materials and separation processes for energy, industrial and environmental applications.