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SEMINAR SERIES

HIGHLIGHTS IN ENERGY RESEARCH

28.03.2019, 16:00 - 17:00, EPFL Valais, 4th floor, ZEUZIER room

Approaches to porous materials development to address separation challenges

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Host : Prof. Wendy Queen

Access to clean water along with sustainable energy and the protection of the environment are probably the greatest challenges of our society but also a unique opportunity to reshape our technology landscape. Major molecular separation issues underpin these areas. Take for instance CO_2 capture: here, one wishes to separate CO_2 from other flue gas (or ambient air) components. Notably, existing separation processes account for 10 to 15% of the world energy consumption. Researchers must propose transformative approaches to molecular separations possibly exploiting the increasing complexity and sophistication of materials available to perform such separations.

This seminar will provide an overview of our research – past and current – in that direction. I will discuss selected examples of our work on the design, synthesis, characterisation and testing of porous materials (*i.e.* sorbents) to address separation challenges related to environmental, water and energy sustainability. I will focus specifically on our study of metal-organic frameworks and porous boron nitride for applications in carbon management and solar energy conversion. I will describe how our approach to material design, which combines aspects of chemistry, materials science and chemical engineering, enables us to identify key materials structure-property relationships while also accelerating the identification of the 'best' material for a given application.

Bio – Dr. Camille Petit is a Senior Lecturer in the Department of Chemical Engineering at Imperial College London, which she joined in September 2013. She currently leads the Multifunctional Materials Laboratory. Prior to this appointment, she was a postdoctoral researcher in Prof. Alissa Park's group at Columbia University. She received her PhD in Chemistry in 2011 from the Graduate Center of the City University of New York working with Prof. Teresa Bandosz. Her research interests broadly encompass the development of porous materials for applications relevant to the energy and environmental sectors. Specifically, she focuses on the synthesis, characterisation and testing of metal-organic frameworks (MOFs)- and nitride-based materials for molecular separations as well as solar energy conversion. Dr Petit has published > 50 peer-reviewed articles. She has one granted patent and has filed two others, all related to the development of sorbent materials. Recently, she received the 2017 AIChE's 35 under 35 award, the 2017 ExxonMobil European Science & Engineering Program Award, the 2017 IOM^3 Silver Medal and the 2015 IChemE Sir Frederick Warner medal.