



## **Seminar - IMAP**

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### **The role of novel porous materials for CO<sub>2</sub> capture applications**

**Abstract.** The Committee on Climate Change has recently recommended a new net-zero greenhouse gases target by 2050, with Scotland recommending a net-zero date of 2045. It was also highlighted that carbon capture and storage (CCS) is a necessity, not an option for achieving this ambitious target. Sector roadmaps have also evidenced specific technologies required for clean growth including carbon capture, utilisation and storage (CCUS).

However, significant challenges remain in growing CCS from the megaton level on CO<sub>2</sub> 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 CO<sub>2</sub> capture, which are hindering the deployment of CCS. The advancement of sorption-based technologies for capturing CO<sub>2</sub> 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 porous solid sorbents for CO<sub>2</sub> capture with superior performance and desirable economics. This lecture 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.

#### **Date and Location:**

**28 January 2020 at 11 AM**  
Salle Conf IV (Room E244)  
Ecole Normale Supérieure  
Department of Chemistry  
24 Rue Lhomond,  
75005, Paris