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Abstract Formulary

Presentation type: **Oral** ✔ **Poster** ✔

Title: Harnessing peer-pressure for carbon capture in aerogels

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ABSTRACT (Space limited to 2200 characters)

Improvement of solids suitable for carbon capturing is a crucial element in reducing and managing atmospheric levels of carbon dioxide. For carbon capturing materials to be efficient and regenerable, heat of adsorption (ΔHads) cannot be neither too low, nor too high. However, flue gases from combustion processes often contain many compounds like H2O, which hinder sequestration and utilisation of CO2. Herein we present a novel approach for the purification of CO2, by utilising an organosilica aerogel which has been gradually functionalised with selected neighbouring groups, creating CO2-philic pockets which facilitate the selective adsorption of carbon dioxide. The introduction of sterically demanding neighbouring groups to an amine in organosilica aerogel monolith creates an energetically favoured environment for CO2-adsorption. Through the controlled conversion of free azide-groups a chemically gradient is established, creating a situation where the same material can be distinguished in a CO2-philic and a CO2-phobic part, in order to separate H2O and other gases from CO2. Such a material lays the foundation for the sequestration of carbon dioxide from flue gases and its catalytically assisted conversion to carbon building blocks within the same material.