



**Wolfson Department of Chemical Engineering Seminar
Lecture Hall 6, Wolfson Department of Chemical Engineering,
Wednesday May 30th at 1:30pm**

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Thermocatalytic conversion of CO₂ into renewable synthetic fuels

Converting CO₂-rich streams (e.g., biogas, landfill gas, flue gases) into synthetic fuels is an attractive route for CO₂ utilization, alternative to CO₂ sequestration by storage. There is a potential to decrease CO₂ emissions significantly and, at the same time, to reduce the consumption of fossil fuels. To make the process sustainable, H₂, which is required for CO₂ hydrogenation to fuels, should have zero or negligible carbon footprint, which is achievable if H₂ is produced via water electrolysis using renewable (hydro, wind, solar) or surplus electricity. However, a number of technological issues remain to be resolved with respect to the design of the CO₂ hydrogenation process, mostly related to catalyst activity, selectivity and stability, and reactor design. This talk outlines recent advances achieved in our group with respect to the thermocatalytic conversion of CO₂ into synthetic methane and syngas. Novel catalytic formulations developed in our group, based on ultra-low metal loadings and emerging catalytic materials, show promising catalytic performance. Possible mechanisms of superior catalytic activity are discussed. Novel reactor configurations are also being developed, focusing on thermal management and performance optimization. Techno-economic assessment is also provided. Altogether, our recent developments provide a new avenue for CO₂ utilization into useful fuels.

Refreshments will be served at 1:15pm