

Sunlight-driven Carbon Dioxide Conversion to Fuels

School:

Chemical Engineering

Supervisory Team:

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Research Area:

Sustainable Chemical Engineering and Catalysis

Description of field of research:

The conversion of carbon dioxide into value-added products, such as methane, is favourable from both an environmental and economic perspective. However, the methanation of carbon dioxide is typically an energy intensive process, requiring temperatures over 400 degrees Celsius. In this work, we will examine the use of light to offset the thermal energy requirements, thus decreasing the overall reaction temperature. To do this, we will design a catalyst which can effectively activate carbon dioxide whilst allowing a light response.

Research Environment

This research will be undertaken within the Particles and Catalysis (PartCat) research group at UNSW. PartCat is lead by Professor Rose Amal and has a range of academics, post docs, PhD students and Honours students. It is a large, supportive and collaborative research environment.

Expected Outcomes

This project will continue from an Honours project which examined the impact of catalyst properties on the light response for carbon dioxide conversion reactions. This project will be used to complete the findings from this project and will result in a publication. Specifically, the findings will be used to generate an understanding of the role of surface basicity and Cobalt deposit size on the extent of response to visible light.

Reference Material/Links

- <https://www.pcrq.unsw.edu.au/>