

# Future Industries Institute Seminars

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## Electrochemical insights into water splitting and the applicability of liquid metals

**Abstract:** The fabrication of nanostructured materials has recently received much attention due to their interesting optical, electronic, chemical and electrochemical properties. A popular method for creating such materials is through an electrochemical approach. Advantages include the ease of fabrication, low cost, sample homogeneity and precise control over the amount of material electrodeposited. The applicability of nanostructured materials created through electrochemical methods is quite extensive and includes electrocatalysts for fuel cells, water splitting, heterogeneous catalysts, substrates for surface enhanced Raman spectroscopy (SERS), superhydrophobic surfaces and as sensing layers for electroanalytical applications.

In this talk an overview is given on how electrochemical methods can be used to both fabricate and characterise a variety of metal oxide/hydroxide nanomaterials. This is critical for research in the area of electrocatalysis which is increasing in importance due to ever growing demands for green energy storage. The storage of intermittent renewable energy in the form of hydrogen through water splitting is of particular interest given the appetite for uptake of solar and wind energy. Here, the role of morphology, composition and crystallinity of mixed metal oxide/hydroxides for electrochemical water splitting is discussed and how this influences electrocatalytic activity.

In the second part of this talk the versatility of electrochemical approaches is also demonstrated via a newly introduced concept of liquid metal marbles that can be actuated under an applied electric field, utilised for electrochemical heavy metal ion detection, photocatalysis and as a pump without any mechanical parts. It is believed that exploration of liquid metals will open up many new areas of research opportunities and applications.

**Wednesday 7th June 2017 at 2 pm – MM1-05, MM Building, Mawson Lakes Campus**

**All welcome!**

