

## Nano-Chevrel Phase Electrocatalysts for Hydrogen Evolution

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Chevrel Phases ( $M_x\text{Mo}_6\text{S}_8$ ) are a class of molybdenum sulfide materials that are attractive candidates for active non-noble metal catalysts due to the relatively low coordination of their molybdenum moieties. Conventionally, the lengthy and energy intensive syntheses of Chevrel Phases produce highly crystalline, low surface area materials. In this talk, a novel synthetic approach leading to a Chevrel Phase with unprecedented nanostructure is presented. The resultant material is fully characterised using a variety of spectroscopic, microscopic, and electrochemical techniques. In electrochemical testing aimed at catalysing the hydrogen evolution reaction, this nanostructured catalyst shows a substantially lower overpotential than an equivalent  $\text{MoS}_2$  phase with similar nanostructure. Furthermore, the nanostructured Chevrel Phases prove to be easily modified by electrochemical intercalation, which allows performance fine-tuning; revealing a new family of versatile and tunable catalysts.