

Pt nanoparticles for fuel cell applications: *In-situ* observation of electrocatalyst deterioration

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Polymer electrolyte membrane fuel cells (PEMFCs) promise a cleaner alternative to the internal combustion engine. To achieve commercial viability precious metal electrocatalyst loadings need to be decreased, especially at the cathode, which is responsible for the kinetically limiting oxygen reduction reaction. One route towards this is the nano-fabrication of the catalyst, the smaller the particle the greater the electrochemically active surface area. However, such state-of-the-art catalysts have poor durability, especially under the constantly changing demands of an automotive environment. As analysis of the underpinning mechanisms has proven difficult using traditional post mortem techniques, we have used x-ray spectroscopies (XAFS and SAXS) to examine *in-situ* the degradation of Pt/C cathode electrocatalysts in an aqueous electrochemical model of a PEMFC under potential cycling. Our observations will be presented.