

## **The UK Supergen Fuel Cell Consortium Project**

Alan Atkinson

Department of Materials, Imperial College, London SW7 2AZ, UK.

---

The first phase of the Supergen fuel cell consortium has brought together four academic partners (Imperial College, Newcastle University, Nottingham University and St Andrews University) with three of the UK's leading industry players (Johnson Matthey, Rolls-Royce Fuel Cell systems and Ceres Power), and the Defence Science and Technology Laboratory (DSTL), to tackle some of the key research challenges underpinning the development of fuel cell technology, specifically in the areas of polymer electrolyte membrane fuel cell (PEMFC) and solid oxide fuel cell (SOFC) integrity, performance, durability and fuel flexibility. The first 4 year phase commenced on September 1st 2005, and has been renewed for a further four years, commencing September 1st 2009. The second phase will introduce a fourth industry partner, Intelligent Energy, and new academic partners; University College London and the Universities of Cambridge and Heriott-Watt. This presentation introduces some highlights from the Solid Oxide Fuel Cell work to date.

The consortium project is structured in work packages with each one concentrating on a particular broad issue. In Phase 1 of the project these included:

- electrolyte compositions and constrained sintering
- sulphur poisoning
- mechanical integrity and modelling
- low temperature cathodes
- microstructure characterisation and modelling of electrodes, and
- fuel-flexible anodes

In Phase 2 these are extended to encompass:

- multi-layer sintering and co-firing
- model integration
- in-situ cell characterisation
- improved anodes and current collectors
- electrode performance degradation
- IT protonic fuel cells.

In this presentation examples will be given from some of these areas that illustrate the approach taken and progress made. Where appropriate, these will be put in the context of other research carried out by the project partners and elsewhere.