



Post Doctoral Researcher : Electrochemical Energy Conversion

Applications are invited for a three-year postdoctoral position in the Physical and Materials Electrochemistry Group based within the School of Chemistry at Trinity College Dublin, led by Dr Mike Lyons. The successful applicant will be expected to undertake research in an SFI funded project entitled: 'Redox and catalytic properties of hydrated metal oxide electrodes for use in energy conversion and storage devices'.

Electrochemical science forms the scientific basis for a feasible solution to the major issue of cheap energy production underpinning the future sustainability of 21st century life. It provides the basis for the hydrogen economy involving the production of molecular hydrogen from non fossil sources, its distribution and storage, and its cold combustion in a fuel cell to generate electricity. There has been a considerable renewal in interest in the optimization of oxygen evolution reaction (OER) and oxygen reduction reaction (ORR) electrode materials, since these reactions decrease the performance of water splitting reactors and fuel cells. In this project a wide range of micro-dispersed metal oxyhydroxide films will be prepared electrochemically using a simple and scalable potential cycling methodology on noble (Pt, Ir, Rh,) and non-noble (Fe, Co, Ni, Mn) metal electrode surfaces and on the latter electrodes coated with randomly oriented meshes of carbon nanotubes, in aqueous solution and characterized using a number of modern electrochemical (steady state and transient), gravimetric, spectroscopic, hydrodynamic and scanning probe techniques. The redox, charge storage, acid/base, and electrocatalytic properties of the hydrated layers will be quantitatively elucidated, and a detailed comparative understanding of the mechanism of water oxidation and oxygen reduction at a series of well defined and characterized oxide coated surfaces obtained for the first time under similar experimental conditions.

Candidates should have a very strong background in physical chemistry/physics and hold a relevant PhD (ideally in Physical Electrochemistry). Proven experience in the use of modern electrochemical methodology/techniques (especially complex impedance spectroscopy and scanning electrochemical microscopy) applied to materials for use in water electrolysis, fuel cell, or sensor applications would be very desirable. S/he should also demonstrate a strong research record including publications (relative to career stage), and be highly motivated and dynamic. Excellent written and oral communication and interpersonal skills are essential, as well as an ability to work within a multidisciplinary team. Normal duties expected of a Post Doctoral Research Fellow will apply, including the preparation of reports and research papers and the supervision of PhD students.

The salary offered is competitive and set within the SFI Post Doctoral Research (Level 2) scales and is dependent upon the candidate's experience and qualifications to date. The post is tenable from 1st March 2011 and will be for 1 year in the first instance. To apply please email a PDF copy of a brief cover letter and CV including publications list, description of research interests, names and contact information of 2-3 referees to melyons@tcd.ie Short-listed applicants will be interviewed. Informal inquiries may also be directed to the same address.