



CONDUCTING POLYMER – Pt FREE – AIR ELECTRODE FOR METAL AIR BATTERIES

Dr. Bjorn Winther-Jensen
Department of Materials Engineering, Monash University

Tuesday 26th August 2008, 4:00 p.m. – 5:00 p.m.
Science Lecture Theatre S10

The oxygen reduction is of broad significance such as fuel-cells and metal/air batteries. The most commonly used electrode for this process employs a Pt catalyst to enhance the reaction rate. This adds significant cost to the electrode and potential poisoning by CO by-products in some applications. Further, it is a well known phenomena that drift of platinum and other catalytic centres causes loss of efficiency during operation. Here we describe an electrode based on a porous material coated with a base inhibited chemically polymerised poly (3,4-ethylenedioxythiophene) (PEDOT), which acts as a high rate oxygen reduction catalyst. Continuous operation for 2 months has been demonstrated without sign of degradation or deterioration of the performance. O₂ conversion rates for the PEDOT electrode are comparable with Pt base electrodes with same geometry. The PEDOT appears to cycle its oxidation state during the oxygen reduction reaction. Metal air batteries from zinc, aluminium and magnesium has been demonstrated with this cathode system.

Visitors are most welcome: Please note the parking arrangements. There is a designated Visitors Car Park (N1) clearly ground-marked by white paint and tickets, at a cost of \$3/day, are available from a dispensing machine. ('Blue' permit designated areas are for Monash members only.). It is also possible to park at other designated Visitors Car Parks (E1, S1 and S2) on the Clayton Campus, but tickets are \$1.4/hour.

Convenor: Dr. Jian-Feng Nie
Tel: 9905 9605
Email: nie@eng.monash.edu.au