

## **Micro Solid Oxide Fuel Cell**

Partho Sarkar and Hongsang Rho

Ceramic Engineering Group  
Advanced Materials Business Unit  
Alberta Research Council, Edmonton, Canada T6N 1E4

The Alberta Research Council Inc. (ARC) is developing Tubular Micro Solid Oxide Fuel Cell ( $\mu$ SOFC). Small diameter SOFC has two main potential advantages, substantial increase in the electrolyte surface area per unit volume of a stack and quick start up. Since fuel cell power is directly proportional to the electrolyte surface area, a  $\mu$ SOFC stack has high potential to substantially increase the power per unit volume. Simple calculation shows a decrease of tube diameter from 22mm to 2mm will increase the electrolyte surface area in a stack at least seven times. Due to its thin wall, a  $\mu$ SOFC has extremely high thermal shock resistance and low thermal mass. These low thermal mass and high thermal shock resistance characteristics are fundamental to reducing start up and turn off time for the SOFC system. Presentation will describe fabrication, microstructure and electrochemical characteristics of  $\mu$ SOFC.