



## ESL ELECTRO-SCIENCE

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### SCANDIA STABILIZED ZIRCONIA ELECTROLYTE FOR SOFC

**King of Prussia, PA (USA), November 2, 2005** - ESL Electro-Science announces increased power density using scandia stabilized zirconia electrolyte in Solid Oxide Fuel Cells

The use of scandia stabilized zirconia (ScSZ) has recently been shown to more than



double the power density achieved with conventional electrolyte materials for Solid Oxide Fuel Cells. ESL Electro-Science announces the commercial availability of ScSZ in both tape form and as a fired substrate – a major step forward for developers of cost-efficient fuel cells.

High temperature solid oxide fuel cells (SOFC's), based on an

oxide-ion conducting electrolyte, offer a clean, low-pollution technology to electrochemically generate electricity at high efficiencies. SOFC provides many advantages over traditional energy conversion systems including high efficiency, reliability, modularity, fuel adaptability, and very low levels of SO<sub>x</sub> and NO<sub>x</sub> emissions.

It is expected that planar SOFC's will have widespread application in the stationary distributed power generation, transportation, and military market sectors. Systems based on both tubular and planar SOFC's are ideal power generation systems—reliable, clean, quiet, environmental friendly, and fuel conserving, hence reducing dependence on imported oil.

The new ScSZ ceramic is made by adding scandia ( $\text{Sc}_2\text{O}_3$ ) to zirconium oxide ( $\text{ZrO}_2$ ) to optimize the crystal structure. The raw materials are first tape cast into a flexible sheet, then sintered at high temperature. The new ScSZ exhibits improved ionic conductivity and mechanical strength while its coefficient of thermal expansion is about the same as yttria stabilized zirconia (YSZ). The use of ScSZ thus helps increase power generating characteristics of the devices, while decreasing size and cost.

ESL Electro-Science is the leading commercial manufacturer of materials for SOFC and other fuel cells. ESL offers stabilized zirconia ceramic tape and fired electrolyte in various compositions, sizes and thicknesses to suit individual users' requirements.

With facilities in North America, Europe, China and Japan, and with over forty three years experience specializing in the development, high-volume manufacture and marketing of thick-film materials and ceramic tapes, ESL operates under ISO 9001:2000 and QS9000:1998 quality management standards.

ESL ScSZ ceramic tape and fired electrolyte, anode tape, sealing glass tape, cover plates, and screen-printable pastes will be on display on Booth 325 at the Fuel Cell Seminar to be held in Palm Springs, California, November 14-18, 2005.