

J. David Carter

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Professional Experience

Materials Engineer, Argonne National Laboratory

November 1996 to Present

- Leader of Electrochemical Ceramics Group supporting SOFC development (Solid state energy conversion alliance - SECA) and high temperature steam electrolysis (Nuclear Hydrogen Initiative)
- Degradation analysis of solid oxide electrolysis stack components using x-ray mapping, XANES, SEM analysis, Raman spectroscopy and 4-point probe.
- Developing advanced oxygen and steam-hydrogen electrodes for High Temperature Steam Electrolysis (present).
- Principle investigator for the *in situ* study of lanthanum manganite air electrodes using XANES (2004-2006).
- Lead inventor and developer of the TuffCell. (2001-2005).
- Developed reforming and water gas shift catalysts for hydrogen generation from hydrocarbons (1997-2001).
- Developed microchannel monolith for ATR catalyst (2000).
- Tested samples & collaborated with vendor to commercialize ATR catalyst (1999).
- Technical advisor of IPP Phase II project-Development of Electrochemical Oxygen Pumps. Worked with Praxair as industry partner. Project directly employs 100 Russian scientists and staff (1999-present).
- Co-developed anode supported ceria-based SOFC, 350 mA/cm² at 450 mV and 500°C (1998).
- Developed tape cast and screen print processes to fabricate <10 micron ceria electrolyte films (1996-1998).

Post Doctorate, Argonne National Laboratory

October 1994 to November 1996

- Developed Anode supported thin film SOFC, 200 mA/cm²@ 450 mV & 800°C
- Developed Tape casting, Screen printing, Gel casting processes for SOFC fabrication.

Visiting Scientist, Risoe National Laboratory

September 1992 to September 1994

- Optimized doped lanthanum chromite for use as an interconnect in the Solid Oxide Fuel Cell in the DK-SOFC program.

- Participated in building the first SOFC stack at Risoe.
- Developed guidelines to reduce interaction between the interconnect and other cell components.
- Consulted with Tioxide Ltd. and Keele University (U.K.) in the development of lanthanum chromite-YSZ composites.

Lab Technician, Ceramatec Inc.

June 1987 to July 1988

- X-ray technician, Synthesized and characterized Y-Ba-Cu-O superconductors, doped TiO₂ for photoelectrolysis, AlN as thermal conductors and Bi₂O₃ as oxygen electrolytes, and synthesized perovskite materials for SOFC program.

Publications

- More than 60 technical publications and presentations
- Ten patents

Awards

- Excellence in Technology Transfer Federal Laboratory Consortium for Technology Transfer May 2002.
- R&D 100 Award 2001 for the development of catalysts for the autothermal reforming of hydrocarbon fuels to hydrogen.
- 2000 National Laboratory Fuel Cell R&D Award

Education

- Ph.D. and M.S., Ceramic Engineering, University of Missouri, Rolla
- B.S., Material Science and Engineering, University of Utah