Brian J. Ingram
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Professional Experience

Argonne National Laboratory, Chemical Sciences and Engineering Division

- Assistant Materials Scientist 2007-present
- Post-doctoral Researcher 2005-2007

Northwestern University, Materials Science and Engineering Department

- Post-doctoral Researcher 2003-2005

At Argonne National Laboratory planned and conducted experiments to identify, characterize, develop and evaluate advanced materials and processes for solid oxide electrochemical devices. Organized and actively pursued new scientific collaborations and programs.

Current Argonne Assignment: Conduct materials research for energy conversion applications, focusing on electrode-gas interfacial properties. Current areas of interest:

- Solid Oxide Fuel Cells (SOFCs)
- Photovoltaics
- Photocatalysts

Technical Highlights

Argonne National Laboratory

- Established electrochemical studies of solid oxide fuel cell cathodes
- Determined performance of perovskite-type cathodes does not scale directly with bulk electrical properties
- Determined the vapor pressure of alkaline metal chromates
- Organizing surface study experiments establishing the role of non-equilibrium electronic, chemical, and structural properties of surfaces in enhancing oxygen adsorption, reduction and exchange

Northwestern University

- Developed a point defect and transport model for the $CuBO_2$ system (B = Al, Y, Sc) for use as p-type transparent conducting oxides
- Initiated work with chemistry and theoretical physics groups at Northwestern University complemented my research
- Developed a novel method to measure the electrical properties of ceramic powders utilizing AC-IS (impedance spectroscopy) and effective medium theory

Professional Society Activities

- Member of American Ceramic Society
- Member of The Minerals, Metals & Materials Society
- Reviewer for Journals: J. American Ceramic Society and J. Electrochemical Soc.

Educational Background

Northwestern University, Evanston, IL, 2003
Ph.D., Materials Science and Engineering,

Carnegie Mellon University, Pittsburgh, PA, 1998
B.S., Materials Science and Engineering
Minor, Chemistry

Selected Publications and Patents

J. D. Carter, T. A. Cruse, B. J. Ingram, and M. Krumpelt. “Factors limiting the low-temperature operation of solid oxide fuelc cells (SOFCs).” In *Advances in Electrocatalysis, Materials*, Diagnostics and Durability, ed. W. Vielstich, H. A. Gasteiger, and A. Lamm, 5: Handbook of Fuel Cells. John Wiley & Sons: Chichester, 2009.

B. J. Ingram, M. Krumpelt, and T. A. Cruse, “Air Electrode Composition for Intermediate Temperature Electrochemical Devices” Filed July 9, 2007

B. J. Ingram, T. A. Cruse and M. Krumpelt, “Potassium-assisted chromium transport in solid oxide fuel cells” *J. Electrochem. Soc.* 154(11), B1200 (2007).

T. A. Cruse, B. J. Ingram, D. -J. Liu and M. Krumpelt. “Chromium reaction and transport in solid oxide fuel cells.” *ECS Transactions* 5(1): 335-341 (2007).

B. J. Ingram, M. I. Bertoni, K. R. Poeppelmeier, and T. O. Mason. "Point defects and transport mechanisms in transparent conducting oxides of intermediate conductivity." *Thin Solid Films* 486(1-2): 86-93 (2005).

B. J. Ingram, G. B. Gonzalez, D. R. Kammler, M. I. Bertoni, and T. O. Mason. "Chemical and structural factors governing transparent conductivity in oxides." *J. Electroceram.*, 13(1/2/3), 167 (2004).

B. J. Ingram, G. B. Gonzalez, T. O. Mason, D. Y. Shahriari, D. Ko, and K. R. Poeppelmeier. “Transport and defect mechanisms in cuprous delafossites. 1. Comparison of hydrothermal and standard solid-state synthesis in $CuAlO_2$” *Chem. Mater.* 16(16), 5616 (2004).

B. J. Ingram, B. J. Harder, N. W. Hrabe, T. O. Mason, and K. R. Poeppelmeier. “Transport and defect mechanisms in cuprous delafossites. 2. $CuScO_2$ and $CuYO_2$.” *Chem. Mater.* 16(16), 5623 (2004).

B. J. Ingram and T. O. Mason. “Powder-solution-composite technique for measuring electrical conductivity of ceramic powders.” *J. Electrochem. Soc.* 150(8), E396-E402 (2003).

B. J. Ingram, T. O. Mason, R. Asahi, K. T. Park, and A. J. Freeman, “Electronic structure and small polaron hole transport of copper aluminate.” *Phys. Rev. B.* 64(15), 155114/1-7 (2001).