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Enhanced thermal stability and electrical characteristics of sputtered Pt thin film for low temperature solid oxide fuel cells

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This work demonstrates a thermal stable nanoporous cathode with atomic layer deposited ZrO_2 capping and Pt-Ni alloying to effectively inhibit the thermal agglomeration of nanoporous Pt. The ZrO_2 capping is found to confine the surface nanoporous morphology and Pt alloying with Ni is found to constrain its underlying microstructure at high temperature operation of 450 °C. The output current using ZrO_2 capped PtNi cathode has a significant improved stability, comparing with pure Pt cathode. The material characterization and electrical impedance spectrum were discussed towards the enhanced thermal stability and electrochemical behaviors.

Recent Publications

K Y Liu, Y J Yoon, S H Lee and P C Su (2017) Sputtered Nanoporous PtNi Thin Film Cathodes with Improved Thermal Stability for Low Temperature Solid Oxide Fuel Cells. *Electrochimica Acta*; 247: 558-563.

J D Baek, K Y Liu and P C Su (2017) A functional micro-solid oxide fuel cell with a 10 nm-thick freestanding electrolyte. *Journal of Materials Chemistry A*; 5: 18414.

Biography

Kang-Yu Liu has received both the Bachelor and Master degrees in School of Material Engineering from National Chung Hsing University, Taiwan in 2004 and 2006 respectively. From 2007 to 2012, he has served as a Research Engineer at Fuel Cell Department, Corporate R&D Center, Delta Electronic, Inc., where he focused on the development of polymer-based fuel cells. He is currently pursuing his PhD degree under the supervision of Assistant Professor Su Pei-Chen at School of Mechanical and Aerospace Engineering, Nanyang Technological University. His main research interests focus on fuel cell & energy conversion Technology

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