**Recent Progress of SOFC Materials Validation in a Generic Stack Fixture**

**at Pacific Northwest National Laboratory**

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The need to bridge the technical gap between small-sized “button” cells and full-sized solid oxide fuel cell (SOFC) stacks was recognized several years ago within the Core Technology Programs. Pacific Northwest National Laboratory has been developing a generic stack test fixture to serve as the vehicle to validate candidate SOFC materials, processing, and operation conditions. In this poster, PNNL will present recent work using the generic stack test fixture in two areas. One was to validate the long-term stability of surface-treated and (Mn,Co)-spinel coated AISI441 interconnect with LSM-based cells at 800oC. The objective of surface treatment was to improve the adhesion of oxide scale. AISI441 interconnect was treated with two different grit size (#40 and #80) followed by standard spinel coating. The electrochemical performance of the cell in terms of cell voltage and impedance over 3000h will be reported and compared to a previously tested sample without the surface treatment of 6000h. The other was to validate the compliant sealing glass (SCN-1 with and without inert fillers) in a combined isothermal ageing and thermal cycling test. LSM-based cells will be sealed onto aluminized AISI441 window frames with plain SCN-1, SCN-1/15% ZrO2 fiber, and SCN-1/ZrO2 hollow balls (5:1 ratio) and tested at 800oC. The cells will be held for 500h at 800oC followed by one deep thermal cycle, and repeated three times. Cell voltage and impedance will be reported along with post-mortem analysis by optical and electron microscopy. The results will provide a preliminary screening test for the compliant sealing glasses.