Abstract Submitted
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Electrical Conductivity of Sr_xVMoO_{6-y}(x=0.0, 0.1, 0.2) Double Perovskite Solid Oxide Fuel Cell Anode[1] NICHOLAS CHILDS, Montana State University Physics Department, ADAM WEISENSTEIN, Montana State University Mechanical Engineering Department, CAMAS KEY, Montana State University Physics Department, STEPHEN SOFIE, Montana State University Mechanical Engineering Department, RICHARD SMITH, Montana State University Physics Department — Solid Oxide Fuel Cells (SOFCs) are suited for high efficiency power generation, fuel flexibility, high temperature electrolysis, closed loop regenerative systems, oxygen generation, and carbon dioxide reduction. These capabilities make the SOFC highly versatile for: primary/secondary power systems, advanced life support, and in-situ resource utilization which may all be desired for a forthcoming lunar return and Mars Exploration. A promising anode material for a SOFCs is the double perovskite $Sr_{2-x}VMoO_{6-y}$(x=0.0-0.2), due to its stability, electronic, and ionic conduction. Anodes of this material were prepared via a tape casting technique. Electrical conductivity was studied in reducing atmospheres at temperatures up to 800 °C. V and Mo valence states were indentified before and after annealing in a hydrogen environment. Samples exhibited metallic conduction with electrical conductivity of $\sim 10^4$S/cm in a reducing atmosphere at 25 °C. A highly insulating $SrMoO_4$ phase forms upon room temperature exposure to air. The $SrMoO_4$ phase can be reduced above 400 °C resulting in an increase in conductivity.

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