

B-site doped pyrochlore for IT-SOFC application

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In this study, Cr-doped $Y_2Ti_2O_7$ were successfully synthesized by sol-gel method. These materials were characterized by powder X-ray diffraction (PXRD), energy dispersive spectroscopy(EDS), inductively coupled plasma atomic emission spectroscopy (ICP-AES), temperature-programmed reduction (TPR), and AC-impedance.

PXRD shown that we could prepared single-phase $Y_2(Ti_{1-x}Cr_x)_2O_7$ compositions with $x \leq 0.4$. We can also find out that the cell parameter increased with higher Cr concentration by cell refining. The quantitation was analyzed by EDS and ICP-AES . TPR shown these materials has reactivity toward hydrogen during 350-450°C. The ionic and electronic conductivity was measured respectively to test if this material could be used as electrode or electrolyte. Other physical and chemical properties will also be study such as thermal expansion coefficients (TECs) and long term stability. Finally, we fabricated a single cell to compare with commercial cell NiO-YSZ|YSZ|LSM.

References:

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