Ref: 202-009

Apresentador **- Margarida Juri Saeki**

Synthesis and characterization of Ru/GDC composite

Silva, R. I. V.(1); Moreno, A. A. (2); Enciso, W. Y. H.(2); Martins, M. L.(1); Ussui, V. (3); Cavalheiro, A. A.(4); Centeno, M. A. G.(2); Odriozola, J. A. G.(2); Saeki, M. J.(1)
(1) Universidade Estadual Paulista-UNESP-Botucatu-SP-Brasil; (2) Universidade de Sevilla-US-Sevilla-Espanha; (3) Universidade Estadual do Mato Grosso do Sul-UFMS-Naviraí-MS-Brasil; (4) Intituto de Pesquisas Energéticas e Nucleares-IPEN-São Paulo-SP-Brasil

This work aimed to prepare a composite of ruthenium and mixed (ionic and electronic) ceramic conductor, Tix(Gd0.2Ce0.8)(1-x)O(2-δ) where 0≥x≥0.1, to be used as internal reforming anodes in Solid Oxide Fuel Cell (SOFC). The ceramic supports were synthesized by Polymeric Precursor Method and characterized by XRD being the structure refined by Rietveld Method (SRRM), adsorption of N2 at 77K, SEM and EDX. The Ru was deposited on ceramic support by Formic Acid Method and reduced under H2 flow. The composite was characterized by ICP-AES, XRD, FEG-SEM (with particle size distribution) and TEM. The XRD/SRRM results showed that the samples crystallize as fluorite single phase when calcined at T=700ºC. The secondary phase of Gd2Ti2O7 was observed in the sample when x≥0.025 if the calcination temperature is increased to 1150ºC. The textural analysis showed significant surface and porosity loss took place when treated at T>700ºC. The XRD analysis of the composite showed that the ruthenium is loaded as metallic form. Ru particle with size of 20nm-400nm was observed in the SEM-FEG images. The ruthenium particles are smaller and more dispersed in the samples containing titania. The TEM analysis showed that Ru particle size is between 10nm and 130nm.