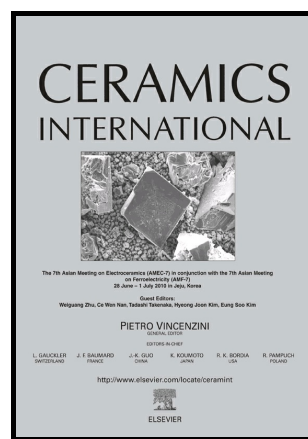


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# Sm-doped cobalt ferrite nanoparticles: a novel sensing material for conductometric hydrogen leak sensor

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## Abstract

Spinel ( $AB_2O_4$ ) metal oxides have gain extensive attention in recent years for gas sensing applications. In the present work, the synthesis, characterization and hydrogen sensing characteristics of nanostructured Sm-doped cobalt ferrite ( $Sm_x-CoFe_{2-x}O_4$ ) have been reported. The structural and morphological properties of the synthesized material were studied by X-ray diffraction (XRD), scanning electron microscopy, micro-Raman and X-ray photoelectron spectroscopy (XPS). In order to check the potential applicability of the synthesized Sm-doped Co-ferrite for hydrogen leak sensing, a simple conductometric sensor has been fabricated and tested. The electrical behavior of the sensor has been recorded by exposure to hydrogen and some interfering gases. The results demonstrated that the sensor developed is promising for the detection of hydrogen leak as it possesses good sensitivity, stable behavior and fast response and recovery.

Keywords, Ferrite, Samarium, Spinel, Nanoparticles, Hydrogen sensor.

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