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# Novel $\text{Pr}_{0.6}\text{Sr}_{0.4}\text{Fe}_{0.8}\text{Co}_{0.2}\text{O}_3:\text{Ce}_{0.8}\text{Sm}_{0.2}\text{O}_2$ composite nanotubes for energy conversion and storage

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### ABSTRACT

One of the most important challenges for further development of solid oxide fuel cells is to design new electrodes which operate at intermediate temperatures. In this sense, the formation of nanostructures of the  $\text{Pr}_{0.6}\text{Sr}_{0.4}\text{Fe}_{0.8}\text{Co}_{0.2}\text{O}_3:\text{Ce}_{0.8}\text{Sm}_{0.2}\text{O}_2$  composite and their characterization have been carried out. These nanostructures have been synthesized using polymeric membranes with 0.1  $\mu\text{m}$  pore size as templates. The electronic microscopy has been used in order to confirm the dimensions of the obtained nanotubes with a wall thickness of 20 nm. The impedance spectroscopy measurements reveal the good performance of these nanostructured materials and the effect that the nanostructures and the addition of a pure ionic conductor have on the electrochemical performance. The synthesized nanostructured composite exhibits an area specific resistance (ASR) value smaller than that obtained for the sample without the nanostructured morphology together with the addition of the pure ionic conductor.

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