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Mechanosynthesis of $\text{Sr}_{1-x}\text{La}_x\text{TiO}_3$ anodes for SOFCs: Structure and Electrical Conductivity

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Abstract

$\text{Sr}_{1-x}\text{La}_x\text{TiO}_3$ (SLT; $0 \leq x \leq 0.5$) powder samples were synthesised at room temperature by a mechanochemical method from SrO , La_2O_3 and TiO_2 mixtures in 90 minutes. The obtained SLT samples as potential anode materials in solid oxide fuel cells (SOFCs) were investigated. The microstructure, electrical conductivity and chemical compatibility with yttria-stabilised zirconia (YSZ) were studied. The powder samples had a nanometric character after milling. After a subsequently heating at 900 °C, the particle size slightly increased, but still remained nanometric. At this high temperature, a good chemical compatibility with YSZ was found. The $x=0.2$ sample gave the best electrical conductivity values, i.e. 0.23 W cm^{-2} . These features make such as-obtained samples good candidates to be used as anodes in SOFCs.

Keywords:

SOFCs; Mechanochemistry; Perovskite Structure; Anode; Electrical Conductivity.

1. Introduction

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