Short Communication

Characterization and electrical properties of a novel Sn_{0.9}Cu_{0.1}P₂O₇/KPO₃ composite electrolyte for intermediate temperature solid oxide fuel cells

Li Zhang, Wei Chen, Wenli Hu *

Fuyang Preschool Education College, Fuyang 236015, China

*E-mail: huwenli830914@126.com

doi: 10.20964/2020.05.04

Received: 2 January 2020 / Accepted: 21 February 2020 / Published: 10 April 2020

In this study, 10 mol% Cu²⁺-doped SnP₂O₇ was compounded with K₂CO₃ to prepare Sn_{0.9}Cu_{0.1}P₂O₇/KPO₃ composite electrolyte. The structure, morphology and medium temperature electrical properties of Sn_{0.9}Cu_{0.1}P₂O₇/KPO₃ were investigated. The Raman spectrometer result showed that Sn_{0.9}Cu_{0.1}P₂O₇/KPO₃ was composed of pyrophosphate and metaphosphate groups. The maximum conductivity of Sn_{0.9}Cu_{0.1}P₂O₇/KPO₃ reached $6.6 \times 10^{-2} \text{ S} \cdot \text{cm}^{-1}$ at 700 °C. The maximum power density of Sn_{0.9}Cu_{0.1}P₂O₇/KPO₃ reached to 131 mW·cm⁻² at 700 °C.

Keywords: Pyrophosphate; Composite; Electrolyte; Conductivity; Fuel cell

[FULL TEXT](#)

© 2020 The Authors. Published by ESG (www.electrochemsci.org). This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).