Continuous Hydrothermal Flow Synthesis of LaCrO₃ in Supercritical Water and Its Application in Dual-Phase Oxygen Transport Membranes

The continuous production of LaCrO₃ particles (average edge size 639 nm, cube-shaped) by continuous hydrothermal flow synthesis using supercritical water is reported for the first time. By varying the reaction conditions, it was possible to suggest a reaction mechanism for the formation of this perovskite material. Moreover, dual-phase oxygen transport membranes were manufactured from the as-synthesized LaCrO₃ particles and (ZrO₂)₀.₈₉(Y₂O₃)₀.₀₁(Sc₂O₃)₀.₁₀ (10Sc₁YSZ), and oxygen permeation fluxes up to 5 × 10⁻⁸ mol cm⁻² s⁻¹ were measured on a 1 mm thick membrane.

General information
Publication status: Published
Organisations: Department of Energy Conversion and Storage, Mixed Conductors, Imaging and Structural Analysis
Corresponding author: Xu, Y.
Pages: 2123-2130
Publication date: 2018
Peer-reviewed: Yes

Publication information
Journal: Industrial and Engineering Chemistry Research
Volume: 57
Issue number: 6
ISSN (Print): 0888-5885
Ratings:
BFI (2018): BFI-level 2
Scopus rating (2018): CiteScore 3.58 SJR 0.907 SNIP 1.128
Web of Science (2018): Impact factor 3.375
Web of Science (2018): Indexed yes
Original language: English
Electronic versions:
taja_acs.iecr.7b04390.pdf. Embargo ended: 22/01/2019
DOIs:
10.1021/acs.iecr.7b04390
Source: FindIt
Source ID: 2395721724
Research output: Contribution to journal › Journal article – Annual report year: 2018 › Research › peer-review