1. Record Nr. UNINA9910346776903321

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Titolo	Electrochemical Performance and Stability of Ba?.?Sr?.?Co?.?Fe?.?O??? for Oxygen Transport Membranes
Pubbl/distr/stampa	KIT Scientific Publishing, 2015
ISBN	1000049670
Descrizione fisica	1 electronic resource (IV, 180 p. p.)
Collana	Schriften des Instituts für Angewandte Materialien - Werkstoffe der Elektrotechnik, Karlsruher Institut für Technologie / Institut für Angewandte Materialien - Werkstoffe der Elektrotechnik
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Sommario/riassunto	Mixed ionic-electronic conducting (MIEC) ceramics as oxygen transport membranes (OTMs) can provide high oxygen permeation rates at comparably low energy demands. For this purpose, Ba?.?Sr?.?Co?.?Fe?.?O??? (BSCF) shows the best performance under ideal operating conditions. Thermal and chemical stability investigations, electrical behavior ?(T,pO?,t), and oxygen exchange parameter extraction by means of electrical conductivity relaxation resulted in a far better understanding of the BSCF system.