

Development of SOFC Cathodes by Electrodeposition

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Cathodes in solid oxide fuel cells (SOFC) catalyze the reduction of oxygen and provide a path for electrons required for that reduction. Infiltration became popular because it provided lower fabrication temperature and good thermal expansion coefficient but it lacked in practicality due to its tedious nature. So, a new method is developed for the fabrication of nanofibrous LaCoO₃ (LCO) perovskites as cathodes (oxygen electrodes) for solid oxide fuel cells (SOFCs). The proposed method involves chemically assisted electrodeposition (CAED) of mixed metal hydroxide onto a carbon nanotube (CNT) template, followed by a low-temperature heat-treatment process. Perovskite-type LCO is then fabricated on the CNT template by CAED process of mixed La-Co hydroxide combined with thermal conversion of hydroxide to perovskite oxide. The new method also provides the precise control needed to achieve desired oxide loadings without the need for repeated deposition-annealing processes.