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Since $La_{0.6}Sr_{0.4}Co_{0.2}Fe_{0.8}O_3$ (LSCF) shows an excellent mixed ionic and electronic conductivity and is stable under oxidizing and reducing atmospheres at high temperatures, it can be a potential candidate material as oxygen permeation membranes, membrane reactors for methane partial oxidation and solid oxide fuel cells.

The oxygen permeation membrane can selectively separate oxygen from air by oxygen partial pressure gradient and the oxygen flux through the membrane depends on its ionic conductivity and thickness. Therefore, thin and dense membrane was coated on a porous support in order to improve the oxygen flux because the oxygen flux increases inversely proportional to the thickness of the membrane.

Currently, yttria-stabilized zirconia (YSZ), magnesia and spinel are used for a porous support material. However, the thermal expansion mismatch between perovskite and support often deteriorate mechanical strength and long-term durability of the membrane at high temperatures.

In this study, a micro-tubular bi-layered membrane consisting of dense and porous LSCF were prepared by electrophoretic deposition (EPD) and dip coating. Microstructure and oxygen permeation behavior were investigated.