CO_2-tolerant dual-phase hollow fiber membrane for oxygen separation from air

박세형, 채진웅, 신민창, 박정훈†
동국대학교
(pjhoon@dongguk.edu†)

Mixed ionic-electronic conducting (MIEC) membranes economically produce high concentrations of oxygen as dense MIEC membranes have a theoretically infinite selectivity at high temperature. High oxygen permeability and structural stability are required in the presence of high concentrations of CO2 for application of oxygen transport membrane in the oxy-fuel combustion process. Ba0.5Sr0.5Co0.8Fe0.2O3-δ (BSCF) was promising material of MIEC membrane, because of high oxygen permeation flux. However, Carbonates were formed over the surface of BSCF-based membranes in the presence of CO2 and oxygen permeation fluxes are deteriorated. Recently, Ce0.8Sm0.2O2-δ (SDC) material has been used for solid oxide fuel cells, because SDC has a high oxide ion conductivity and can tolerate the corrosion by CO2 and H2O. In this work, dense dual-phase hollow fiber membranes were prepared by a phase inversion spinning and sintering process. The phase composition and the microstructure of the membranes were characterized by XRD, SEM analysis.
Keywords : CO2-tolerant, Oxygen separation, Dual-phase, Hollow fiber membrane