Performance simulation of temperature stress and flow characteristic of SOEC stack using computational fluid dynamics

김종민*, 홍현선
고등기술연구원
(jmkim@iae.re.kr*)

Solid oxide electrolysis cell(SOEC) is recognized a technology capable of producing hydrogen for a future hydrogen economy. The aims of this study are to investigate that evaluate the suitability of a different kind materials at high-temperature and a flow characteristics in cell and manifold. A three-dimensional computational fluid dynamics (CFD) model has been created to model high temperature steam electrolysis in a flat-tube type short stack(3-cells). Pressure and velocity distribution, and steam fluid are provided via the core features of the commercial CFD code CFX. Model results provide detailed profiles of temperature, low pressure drop, constant velocity. Therefor, flat-tube type cell(4-channels) was appropriately designed cell channels and manifold for uniformly fluid and low pressure drop.