Supporting information

Effect of Fe/Co ratio on the structure and oxygen permeability of Ca-containing composite membranes

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Fig. S1 the Rietveld refinement pattern of the CPO-PCFCO powder after calcined at 950 °C under the air atmosphere at room temperature
Fig. S2 The XRD patterns of CPO-PCCO powder before and after calcined at 950 °C for 20 hs under Ar ambient and the decomposed powder after calcined at 950 °C for 20 h under Air ambient.
**Fig. S3** The SE images of CPO-PCFCO composite membranes after sintering.
**Fig. S4** The XRD patterns of CPO-PCFCO membranes after sintering.
Fig. S5 XRD patterns of fresh and spent $x = 0.6$ membrane dual phase membrane in the long-term oxygen permeation measurements with pure He as sweep gas.
Fig. S6 EDXS mappings of the cross-section view (the sweep side) of $x = 0.6$ membrane after long-term CO$_2$ stability tests.
Fig. S7 EDXS mappings of the plan view (the feed side) of $x = 0.6$ membrane after long-term CO$_2$ stability tests.