

## Supporting information

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

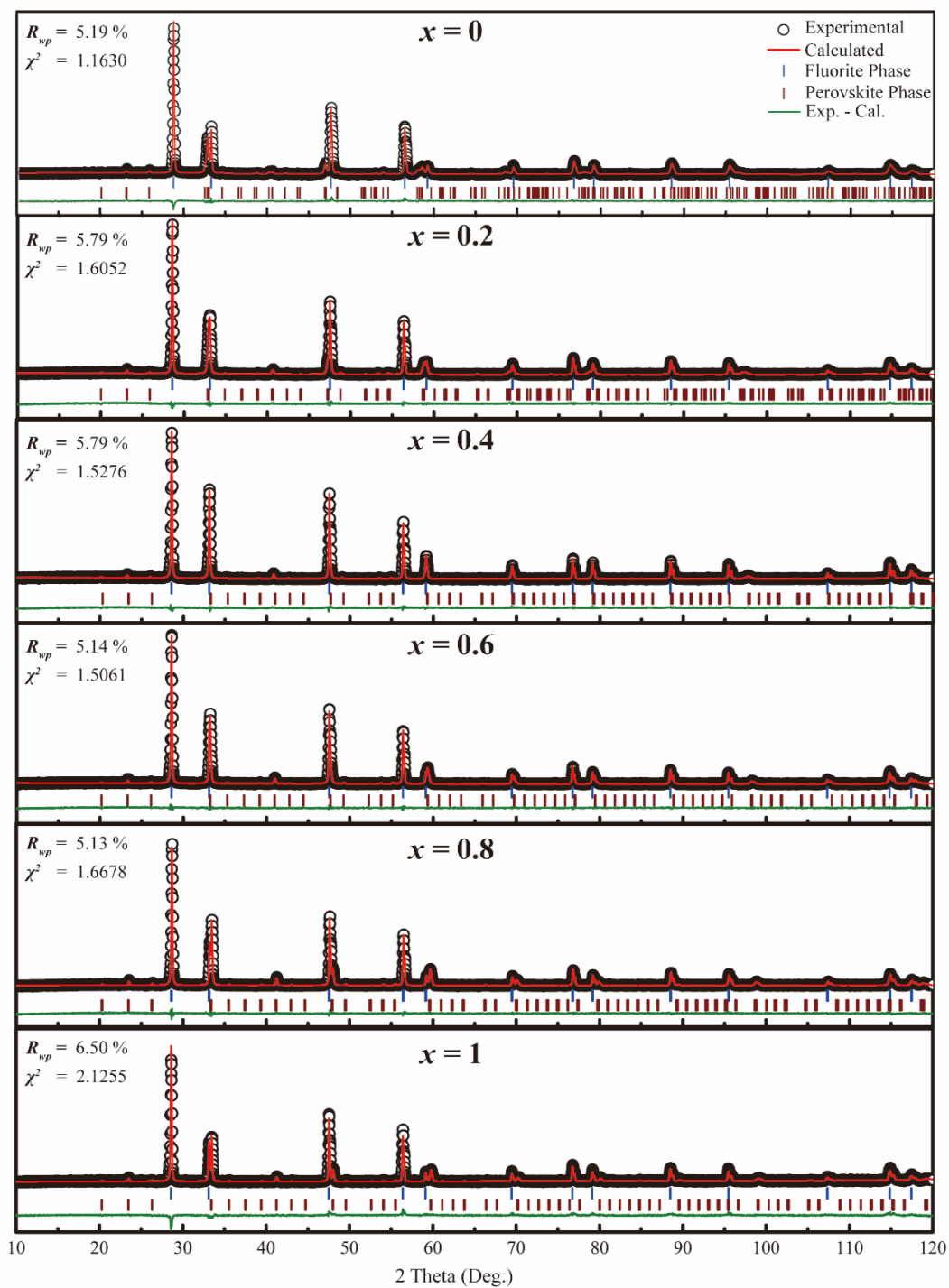
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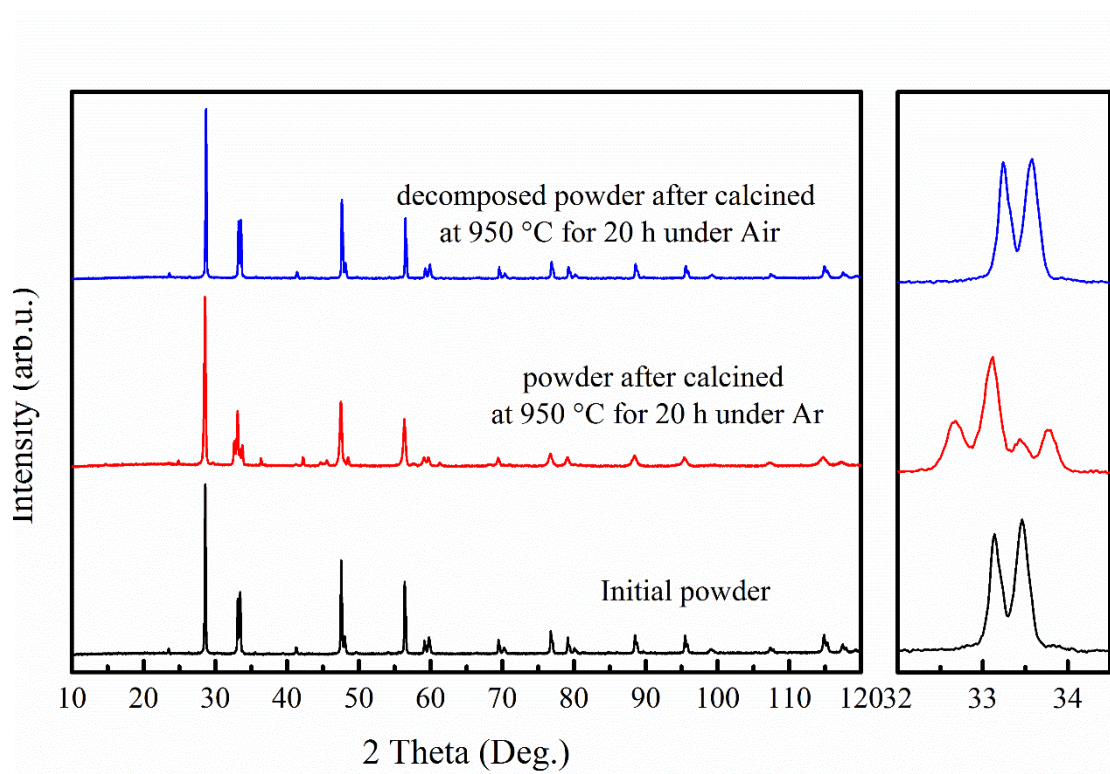
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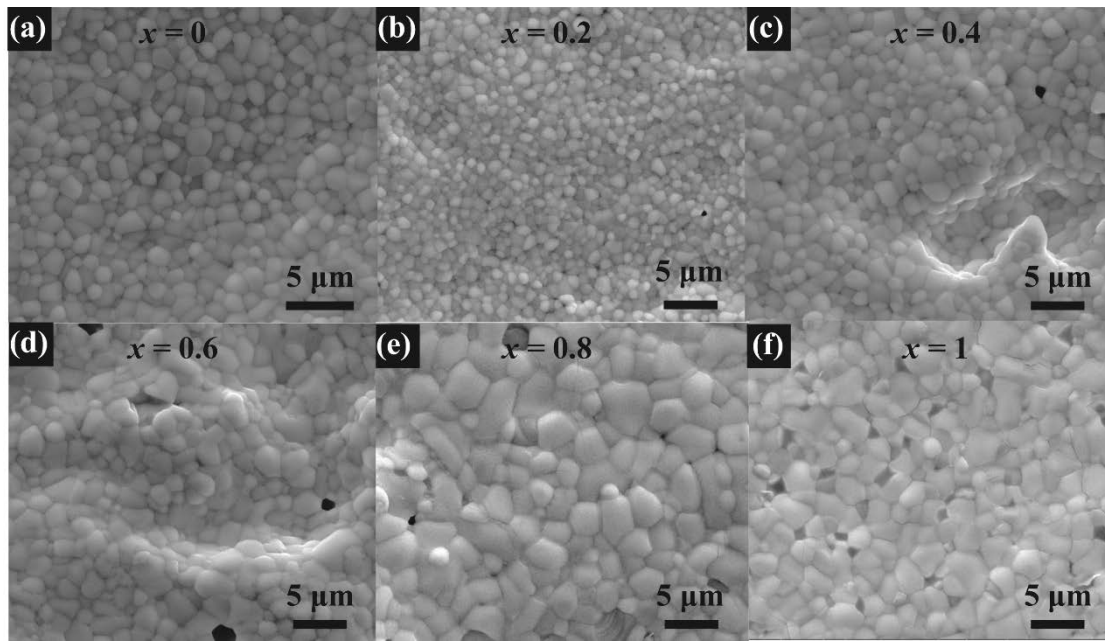
*luohx7@mail.sysu.edu.cn*



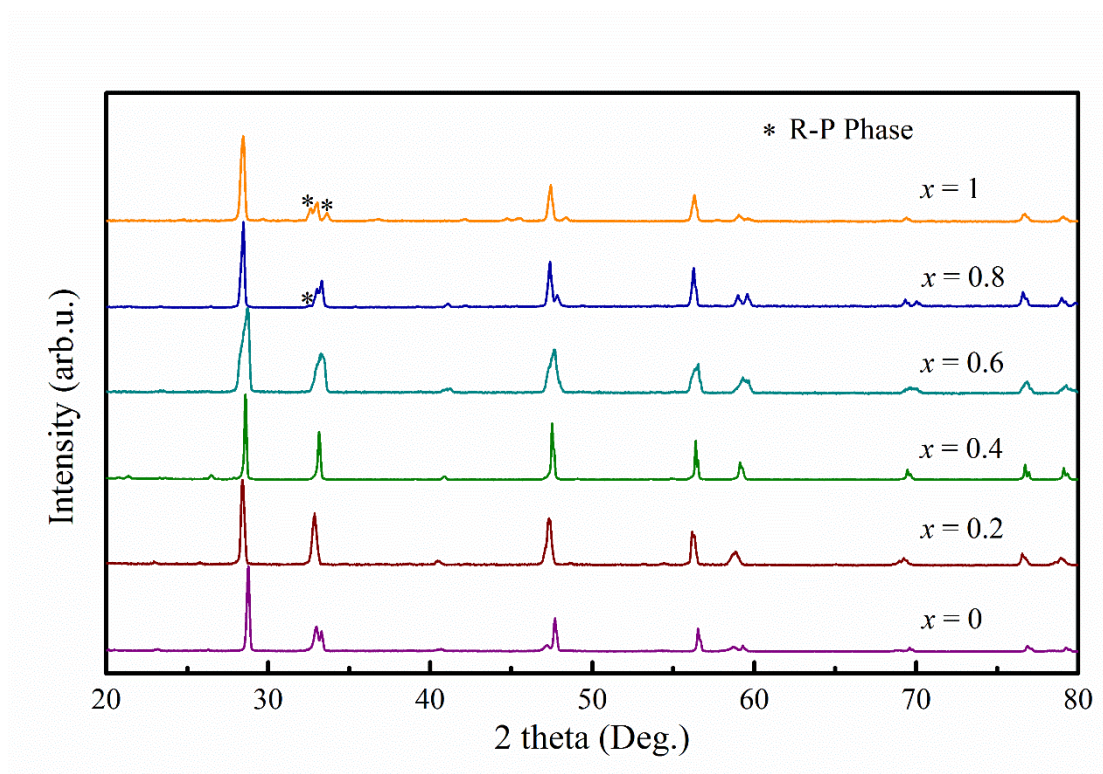
**Fig. S1** the Rietveld refinement pattern of the CPO-PCFCO powder after calcined at 950 °C under the air atmosphere at room temperature



**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.

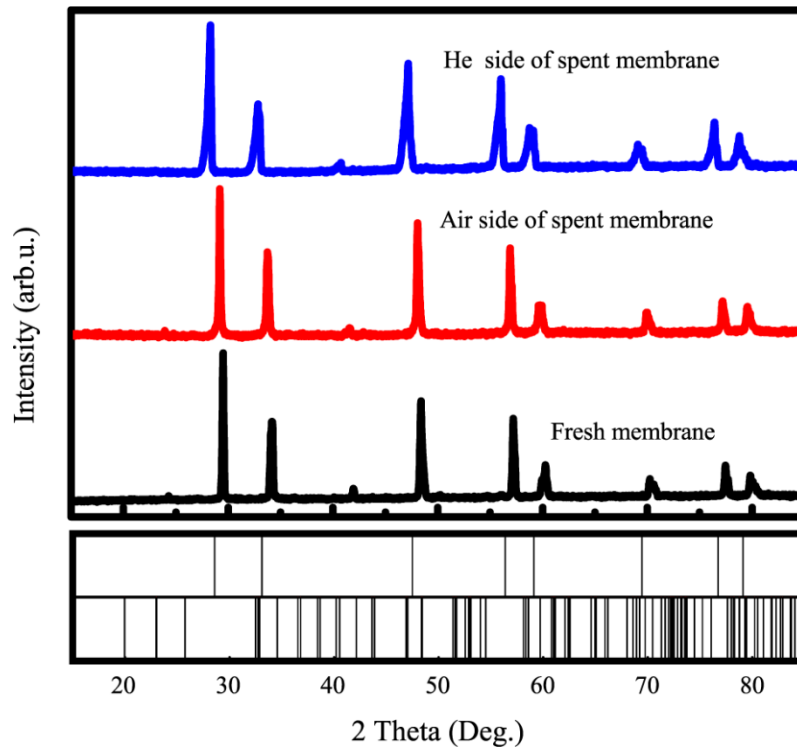
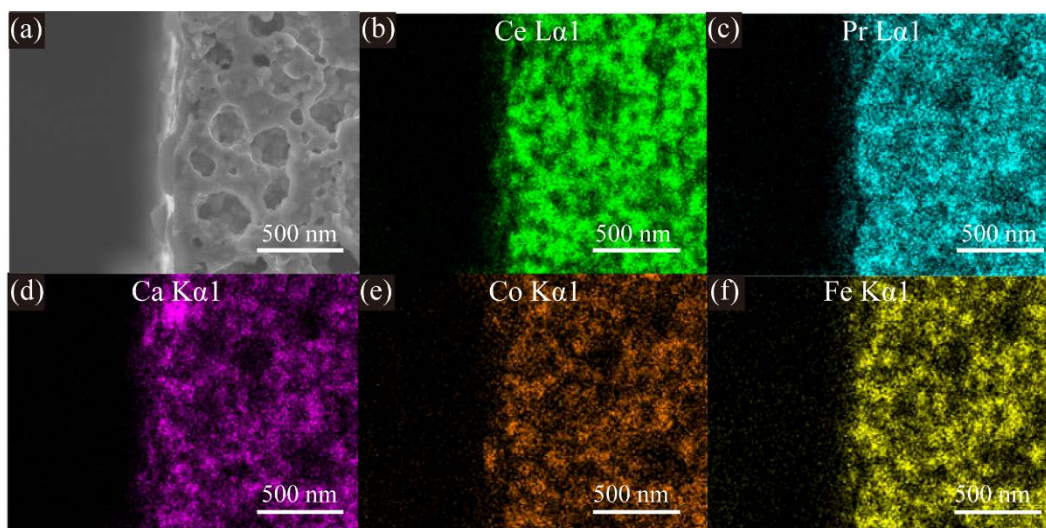
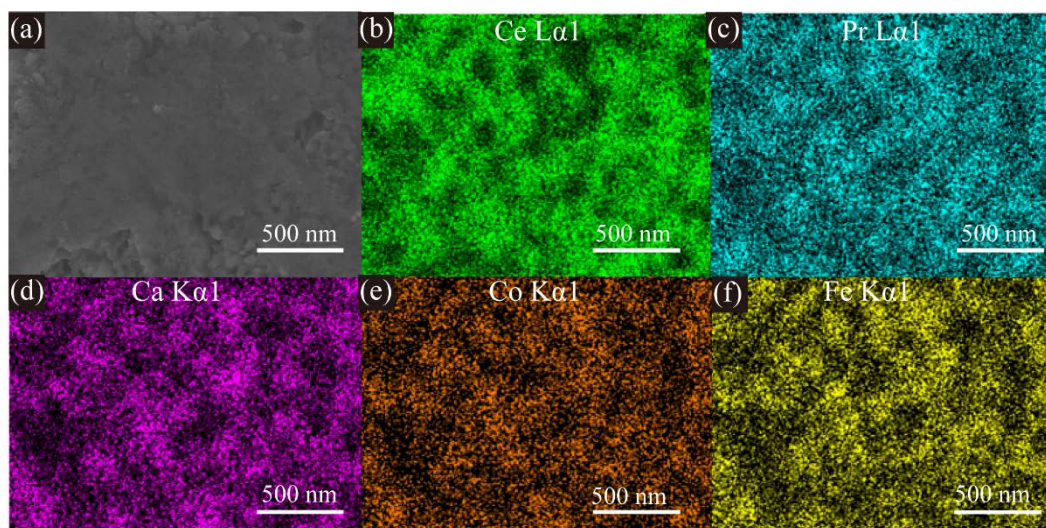


Fig. S5 XRD patterns of fresh and spent  $x = 0.6$  membrane dual phase membrane in the long-term oxygen permeation measurements with pure He as sweep gas.



**Fig. S6** EDXS mappings of the cross-section view (the sweep side) of  $x = 0.6$  membrane after long-term CO<sub>2</sub> stability tests.



**Fig. S7** EDXS mappings of the plan view (the feed side) of  $x = 0.6$  membrane after long-term  $\text{CO}_2$  stability tests.