

Figure S1. (a) scheme of the sintering set-up; (b) a stacking system in practice.

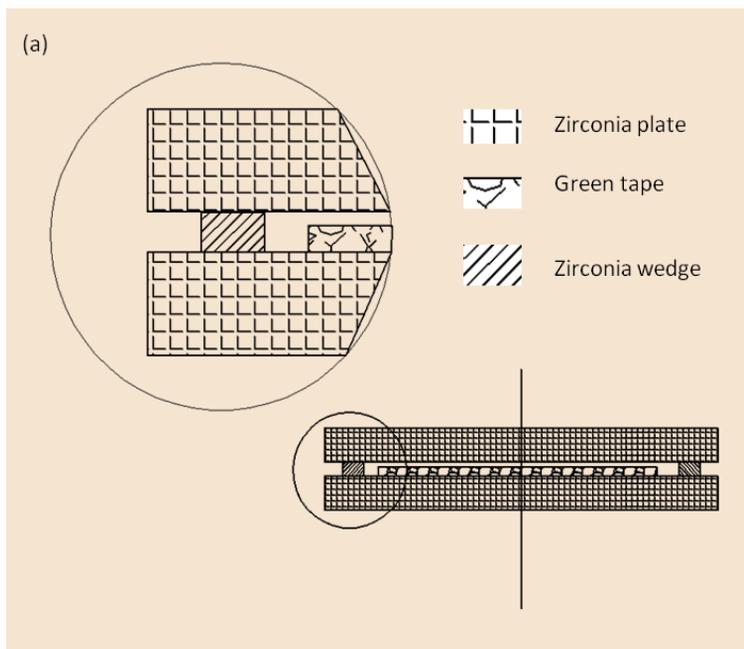


Figure S2. Schematics of the ECN jig. (a) shows the assembly of the ceramic components for holding the fuel cells; (b) is the bottom view to show the channel of scanning gas distributor. The current collectors on the fuel or air distributor are neglected.

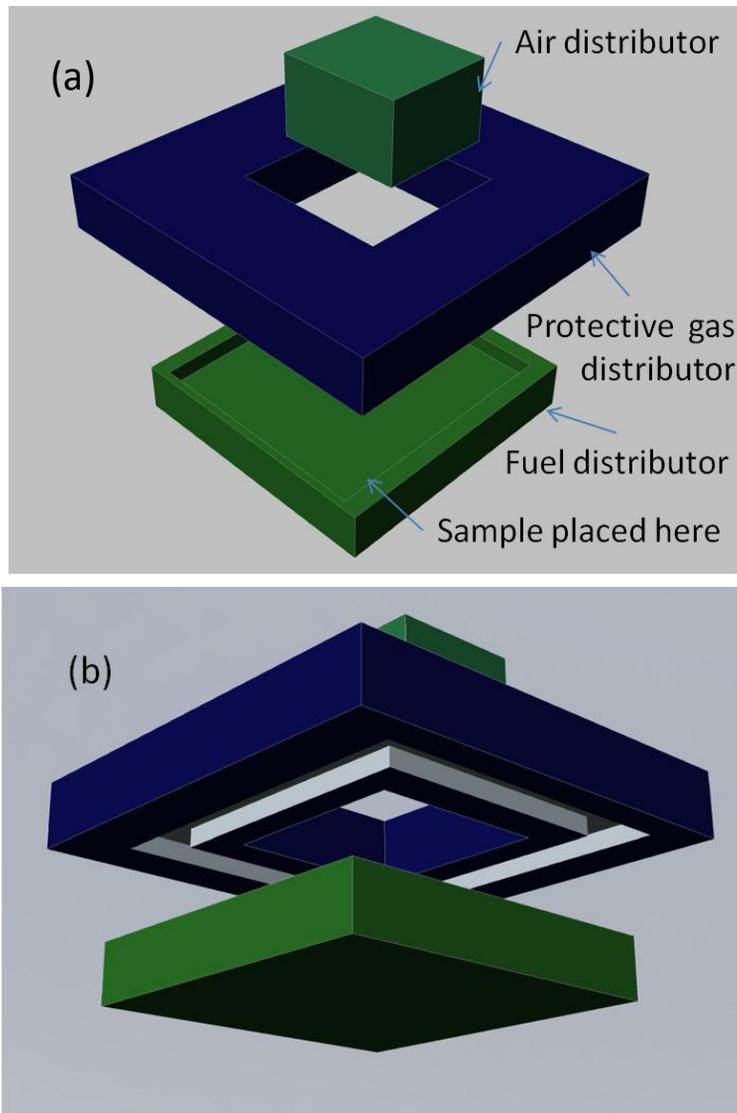


Figure S3. Images of the tri-layer scaffold with (left) and without (right) the frame.

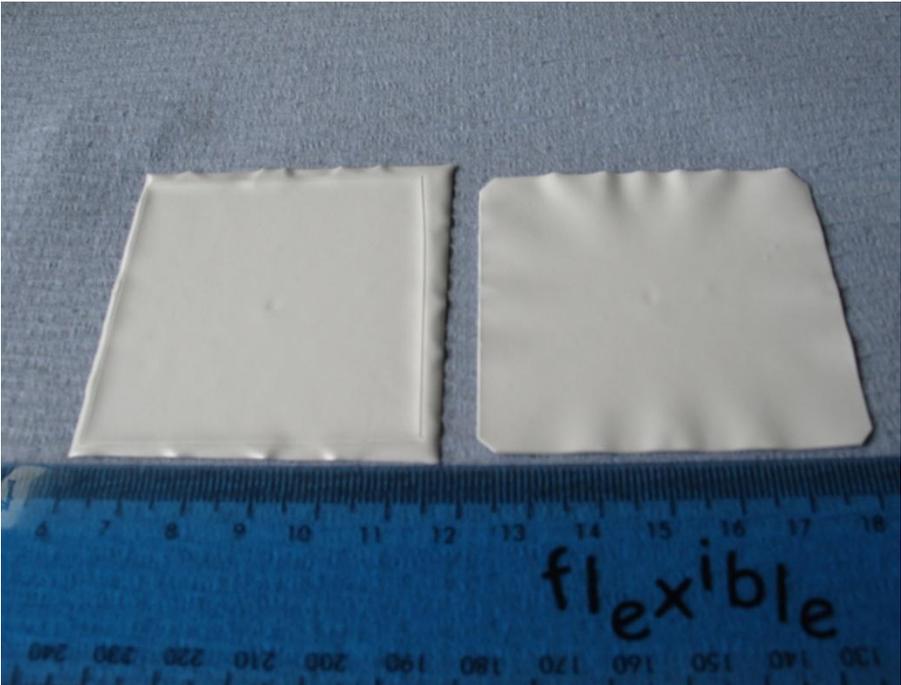


Figure S4. XRD patterns for the  $\text{LSV}_{\text{ox}}/\text{YSZ}$  (black line) and  $\text{LSV}_{\text{red}}/\text{electrode}$  (red line).

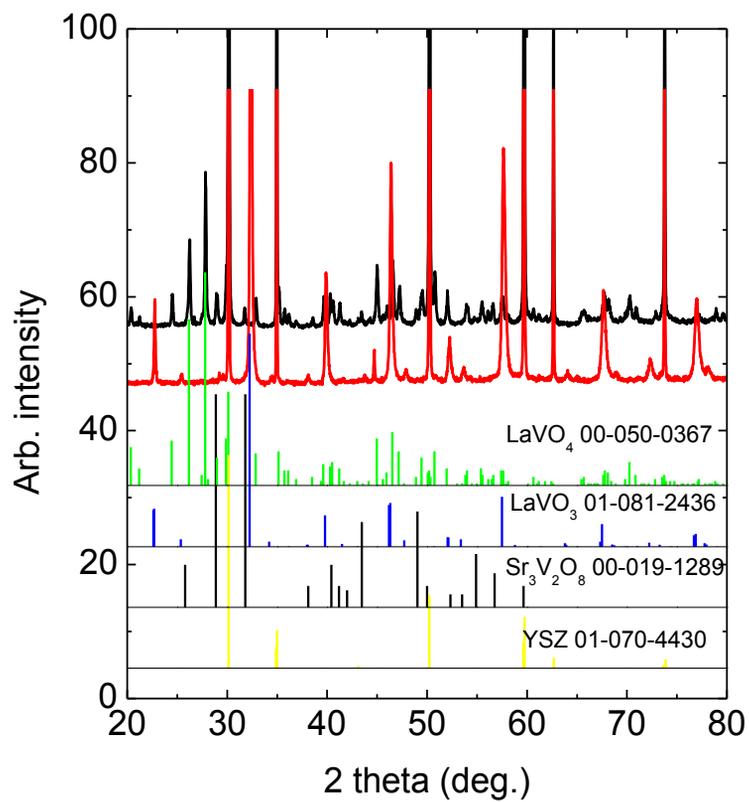


Figure S5. XRD pattern of LSV/YSZ composite electrode after reduction at 800 °C 4.2% steam containing H<sub>2</sub>. The dots are observed data and the green line is calculated data. The vertical bars are calculated reflections for phases. Upper red represents LSV orthorhombic with symmetry Pbma and bottom black belongs to YSZ cubic with symmetry Fm-3m.

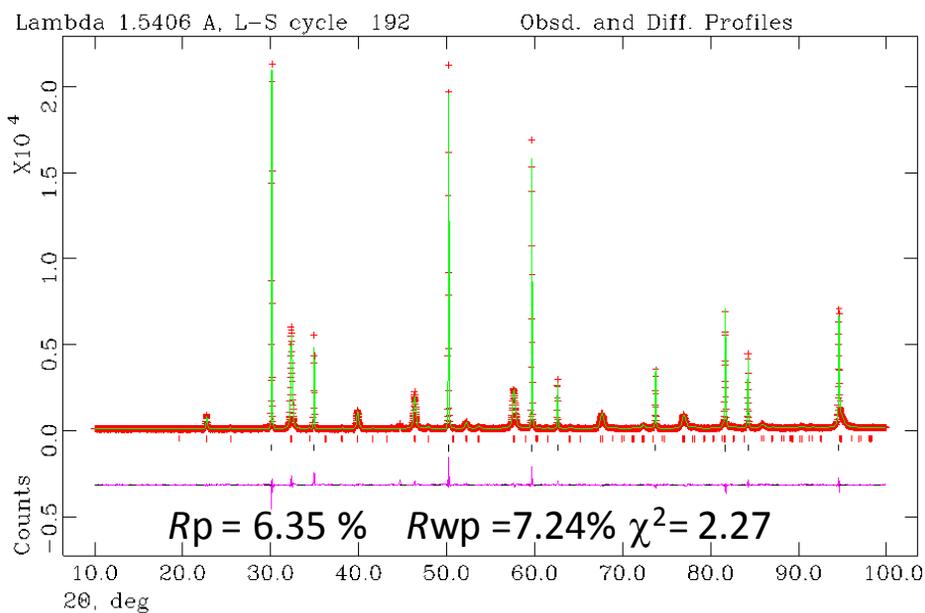


Figure S6. SEM images of  $\text{LSV}_{\text{ox}} / \text{YSZ}$  with ceria only after a calcination at 900 °C for 30 min.

