Supporting Information

Efficient intermediate-temperature steam electrolysis with Y:$SrZrO_3$−$SrCeO_3$ and Y:$BaZrO_3$−$BaCeO_3$ proton Conducting perovskites

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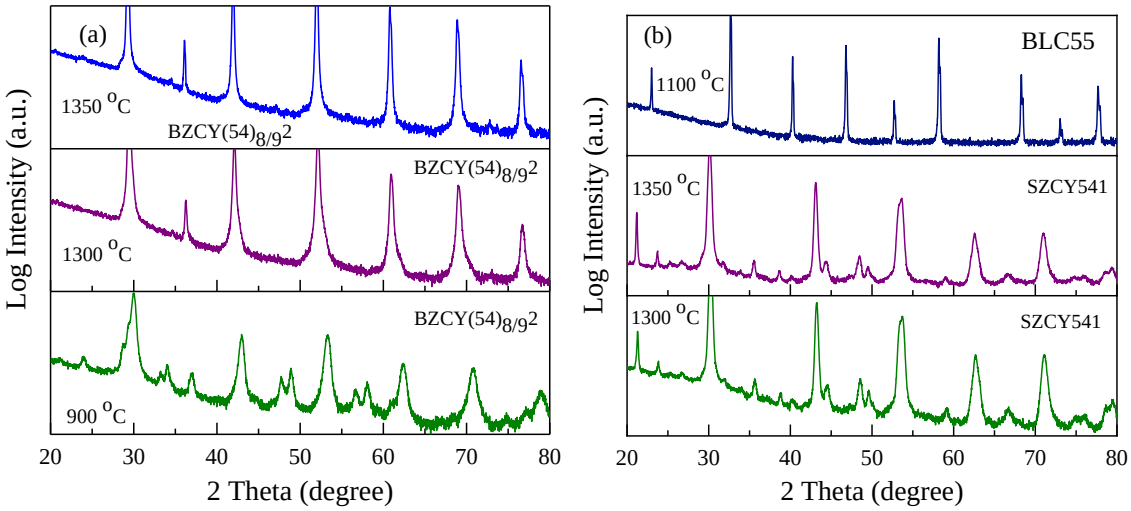

Figure S1. XRD patterns of (a) BZCY(54)$_{8/9}$2 powder calcined at 900, 1300 and 1350 ºC (b) SZCY541 powder calcined at 1300, 1350 ºC and BLC calcined at 1100

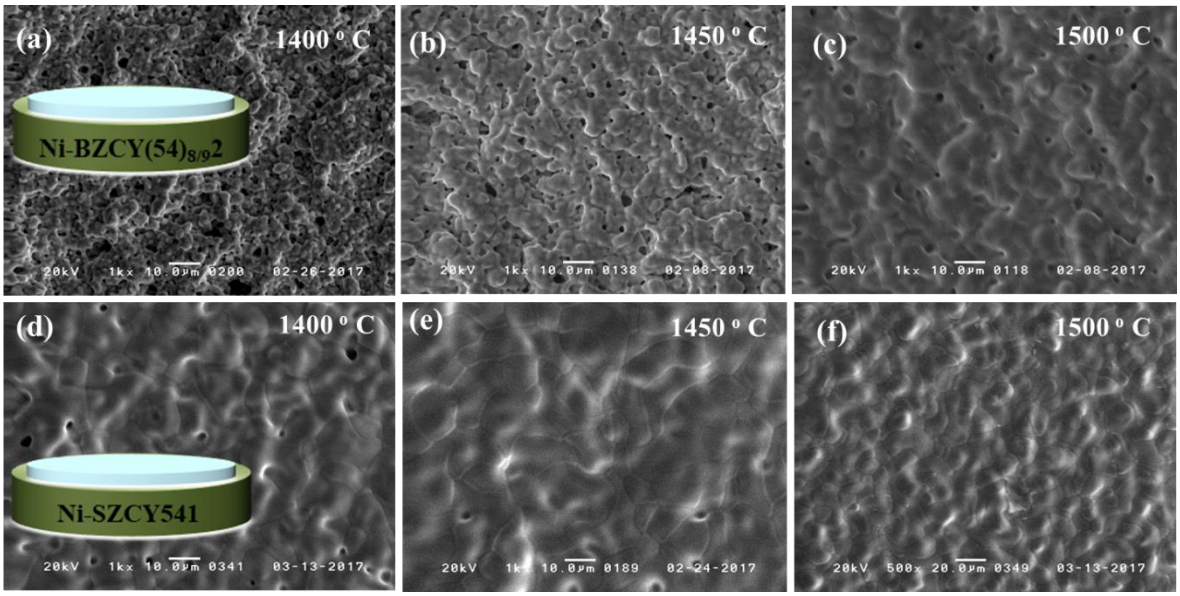

Figure S2. SEM micrographs of BZCY(54)$_{8/9}$2 surface view, supported on NiO–BZCY(54)$_{8/9}$2 cathode substrate after sintering at (a) 1400, (b) 1450, (c) 1500 ºC and on NiO–SZCY541 cathode substrate after sintering at (d) 1400 (e) 1450 (f) 1500 ºC

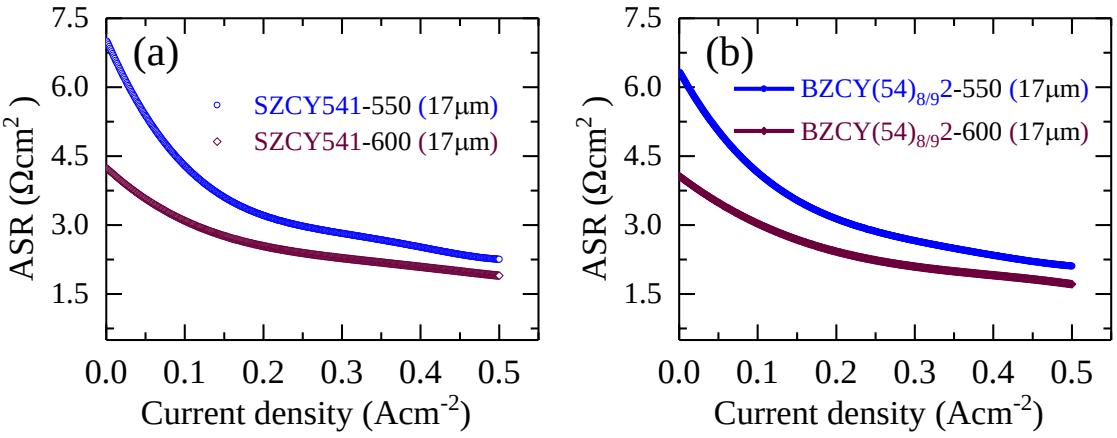

Figure S3. The area specific resistances (ASRs) extrapolated from the gradient of the I-V curves (a) BLC|SZCY541|Ni-SZCY541 (b) BLC|BZCY(54)$_{8/9}$2|Ni-SZCY541 cathode supported button type single cells

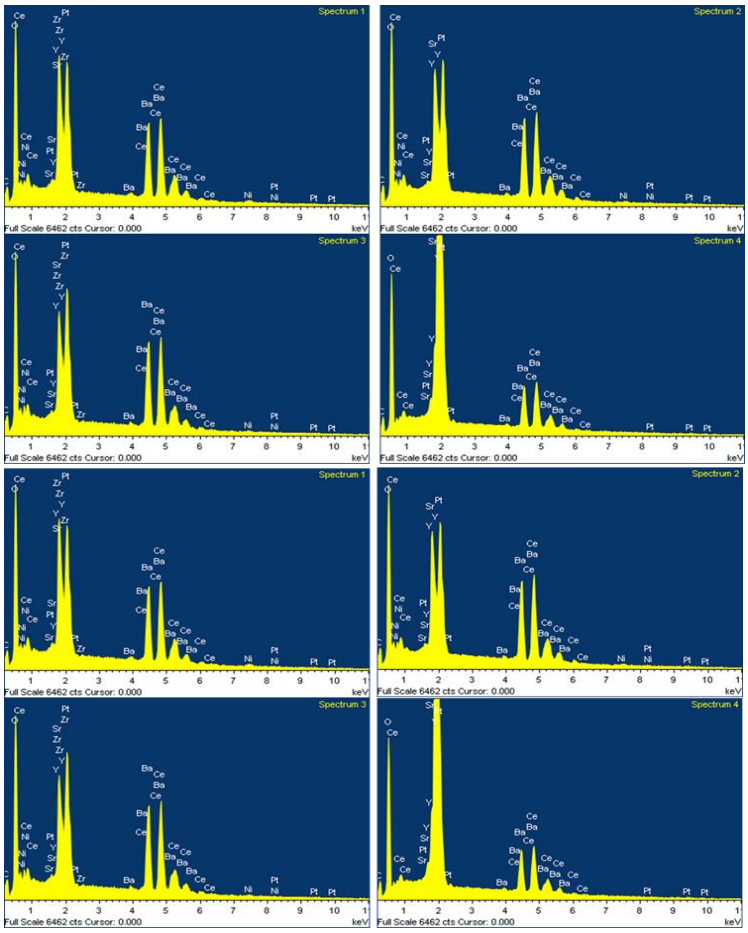

Figure S4. EDS analysis of a polished cross section of a typical BLC|BZCY(54)$_{8/9}$2| Ni-SZCY541

cathode supported button cell shown in Fig 7

Table S1 Summary of results obtained from Rietveld analysis of the X-ray powder diffraction data for $BZCY(54)_{8/9}2$ and SZCY541 at 295K.

$BZCY(54)_{8/9}2$ electrolyte powder		SZCY541 electrolyte powder
Parameters	XRD data analysis	XRD data analysis
Space group	$Pm\bar{3}m$	$Pnma$
a=b=c(Å)	4.3035(2)	$a = 5.9668(4)$ $b = 8.3850(6)$ $c = 5.9184(4)$
V(Å^3)	79.705	296.111
R_p	6.25	7.48
R_{wp}	9.50	10.9
R_{Bragg}	5.44	4.67