

Supplementary information

Synthesis and characterization of high temperature properties of $\text{YBa}_2\text{Cu}_3\text{O}_{6+\delta}$ Superconductor as potential cathode for Intermediate Temperature Solid Oxide Fuel Cells

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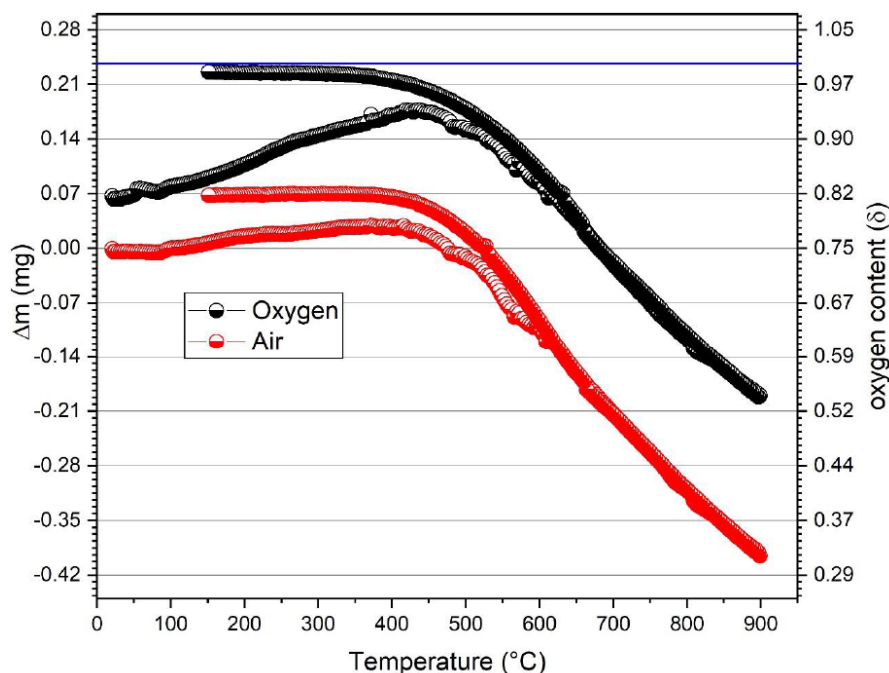


Figure S1: Comparison between consecutive TG plots in synthetic air and pure oxygen of YBC powder. The absolute oxygen content is estimated assuming that the sample just cooled in air has the oxygen content $\delta = 0.82$ (see text). Note that the oxygen sample on cooling reaches an oxygen content below but close $\delta = 1$ as expected for the preparation procedure of $\text{YBa}_2\text{Cu}_3\text{O}_7$.

Table S1: Equivalent Circuit Elements and their Value as a Function of Temperature

Element	500 °C	550 °C	600 °C	650 °C	700 °C	750 °C	800 °C
Rs	20.13(5)	15.31(2)	13.49(2)	12.980(11)	12.230(4)	9.494(3)	8.325(3)
R1	23.49(5)	10.14(2)	6.4(2)	2.5(2)	1.715(8)	0.560(5)	0.357(4)
CPE1-T	0.002291(17)	0.00254(3)	0.00464(8)	0.018(2)	0.0125(2)	0.0139(7)	0.0254(15)
CPE1-P	0.8409(17)	0.836(3)	0.813(4)	0.581(17)	0.677(4)	0.677(8)	0.687(9)
W(1,2)-R	3.83(14)	2.41(11)	1.15(11)	---	---	---	---
W(1,2)-T	0.0032(3)	0.0031(3)	0.0037(8)	---	---	---	---
W(1,2)-P	0.275(7)	0.300(7)	0.336(16)	---	---	---	---
R2	---	---	---	0.9(2)	0.084(7)	0.161(5)	0.186(3)
CPE2-T	---	---	---	0.0117(8)	14(2)	3.20(18)	4.05(13)
CPE2-P	---	---	---	0.97(5)	0.99	0.99(5)	0.88(17)
Chi-Squared	1.9E-5	1.2E-5	3.4E-5	8.6E-5	5.7E-5	3.8E-5	2.8E-5
Sum of Sqr	0.0014	0.00076	0.0021	0.0061	0.0038	0.0021	0.0017
ASR ($\Omega \text{ cm}^2$)	6.83	3.14	1.89	0.85	0.45	0.18	0.14