

Electronic Supplementary Information (ESI)

High performance $\text{La}_2\text{NiO}_{4+\delta}$ oxygen and $\text{Ni-Ce}_{0.9}\text{Gd}_{0.1}\text{O}_{2-\delta}$ fuel electrodes for thin film reversible solid oxide cells

Adeel Riaz ^a, Juande Sirvent ^b, Juan Zueco-Vincelle ^c, Fjorelo Buzi ^b, Silvère Panisset ^a, Alexander Stangl ^a, Laetitia Rapenne ^a, Federico Baiutti ^b, Michel Mermoux ^d, Miguel Angel Laguna-Bercero ^c, Albert Tarancón ^{b,e}, Mónica Burriel ^{*a}

a. Univ. Grenoble Alpes, CNRS, Grenoble INP, LMGP, 38000 Grenoble, France.

E-mail: monica.burriel@grenoble-inp.fr

b. Catalonia Institute for Energy Research (IREC), Jardins de les Dones de Negre 1, 08930 Sant Adrià del Besòs, Barcelona, Spain

c. Instituto de Nanociencia y Materiales de Aragón (INMA), CSIC-Universidad de Zaragoza, Zaragoza 50009, Spain

d. Univ. Grenoble Alpes, Univ. Savoie Mont Blanc, CNRS, Grenoble INP, LEPMI, 38000, Grenoble, France

e. ICREA, 23 Passeig Lluís Companys, 08010 Barcelona, Spain

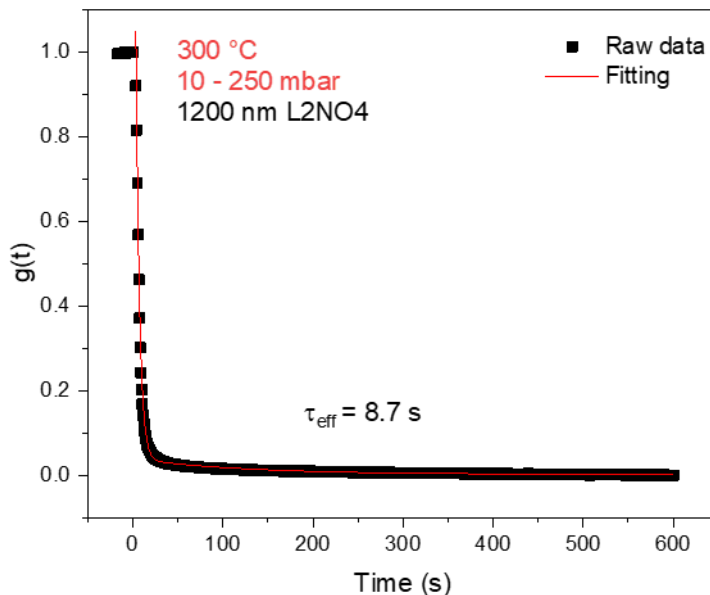


Figure S1: Normalized conductance of a 1200 nm thick L2NO4 film grown on a YSZ substrate, measured at 300 °C using ECR, in response to a pO_2 variation from 10 to 250 mbar

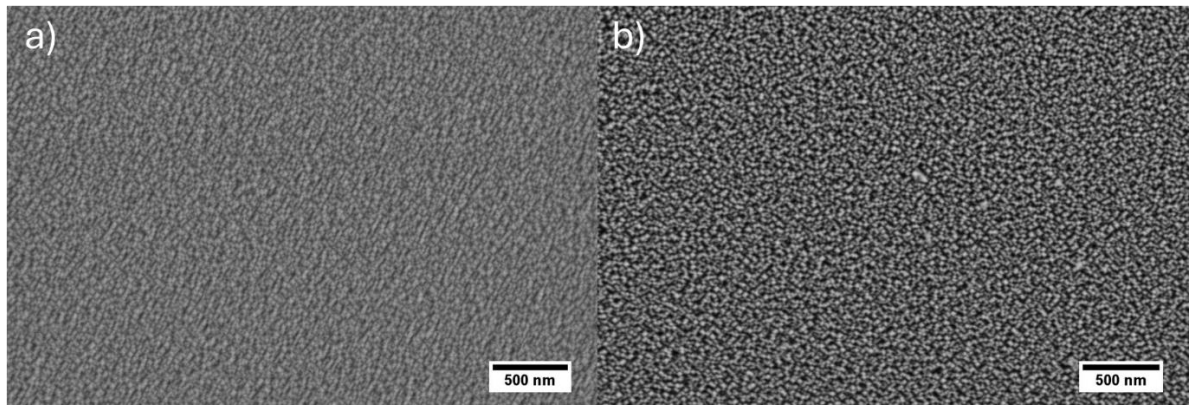


Figure S2: SEM micrographs of the pristine NiCGO_{200mT-500C-TT} thin film (a) and after the annealing process (b).

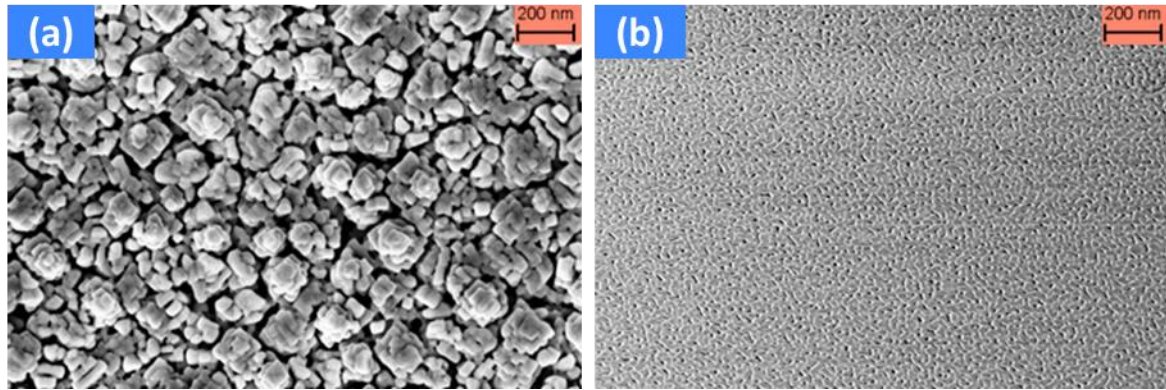


Figure S3: SEM images of surfaces of the rSOC on the: (a) 1000 nm L2NO₄ oxygen electrode side, and (b) 120 nm Ni-CGO fuel electrode side

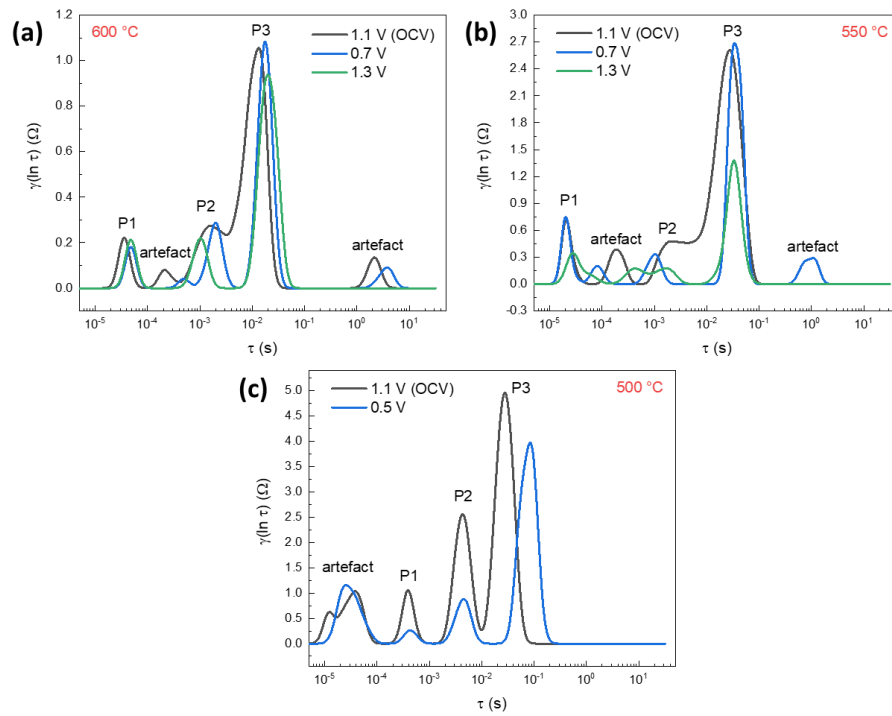


Figure S4: Distribution of relaxation times (DRT) analysis of the rSOC EIS at OCV (1.1 V), in SOFC (0.7 V), and SOEC (1.3 V) operating modes at different temperatures: (a) 600 °C, (b) 550 °C, and (c) 500 °C