Supplementary materials

Tailoring Ni and $Sr_2Mg_{0.25}Ni_{0.75}MoO_{6-\delta}$ cermet compositions for designing the fuel electrodes of solid oxide electrochemical cells

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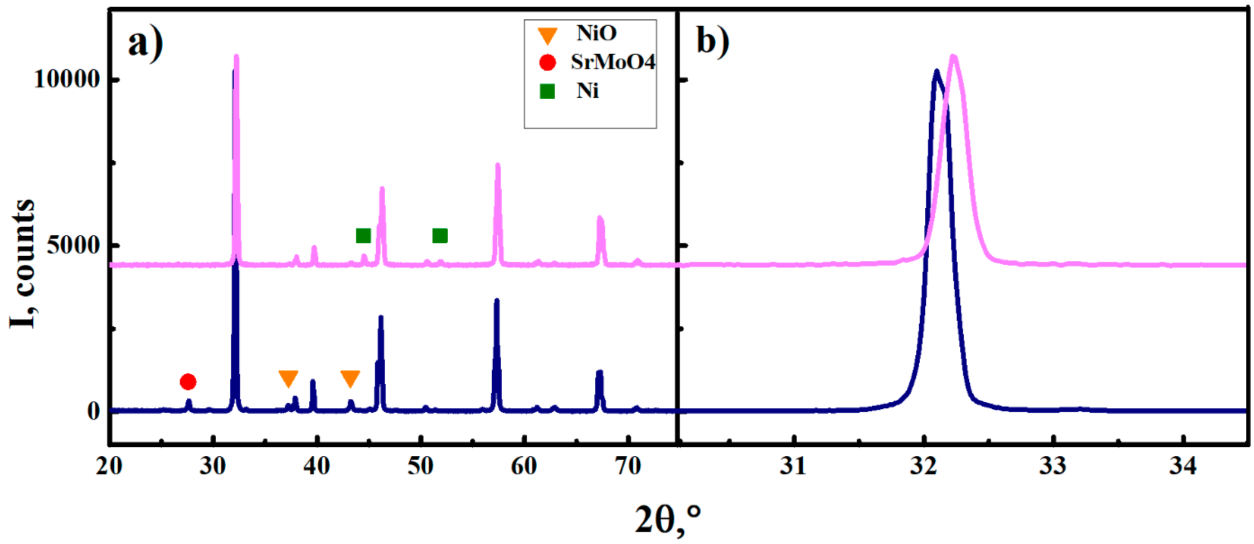

Figure S1. Comparison of the XRD data of the $50Sr_2Mg_{0.25}Ni_{0.75}MoO_{6-\delta} + 50NiO$ (lower pattern) and $50Sr_2Mg_{0.25}Ni_{0.75}MoO_{6-\delta} + 50Ni$ (upper pattern) composites: general view (a) and detailing of the most intensive reflection (b).

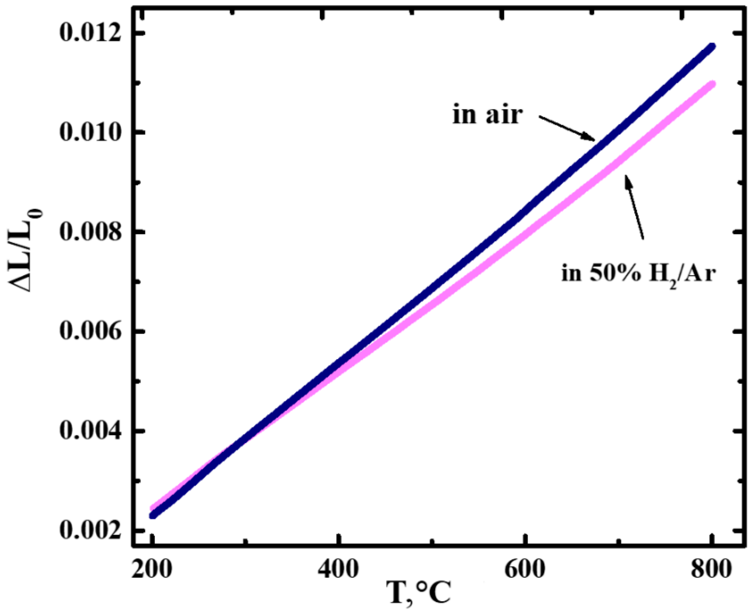

Figure S2. Comparison of the relative dimension changes of the sintered $50Sr_2Mg_{0.25}Ni_{0.75}MoO_{6-\delta}$ + 50NiO composite in air and the reduced $50Sr_2Mg_{0.25}Ni_{0.75}MoO_{6-\delta}$ + 50Ni composite in H_2 + Ar atmosphere. The data were obtained under cooling mode.

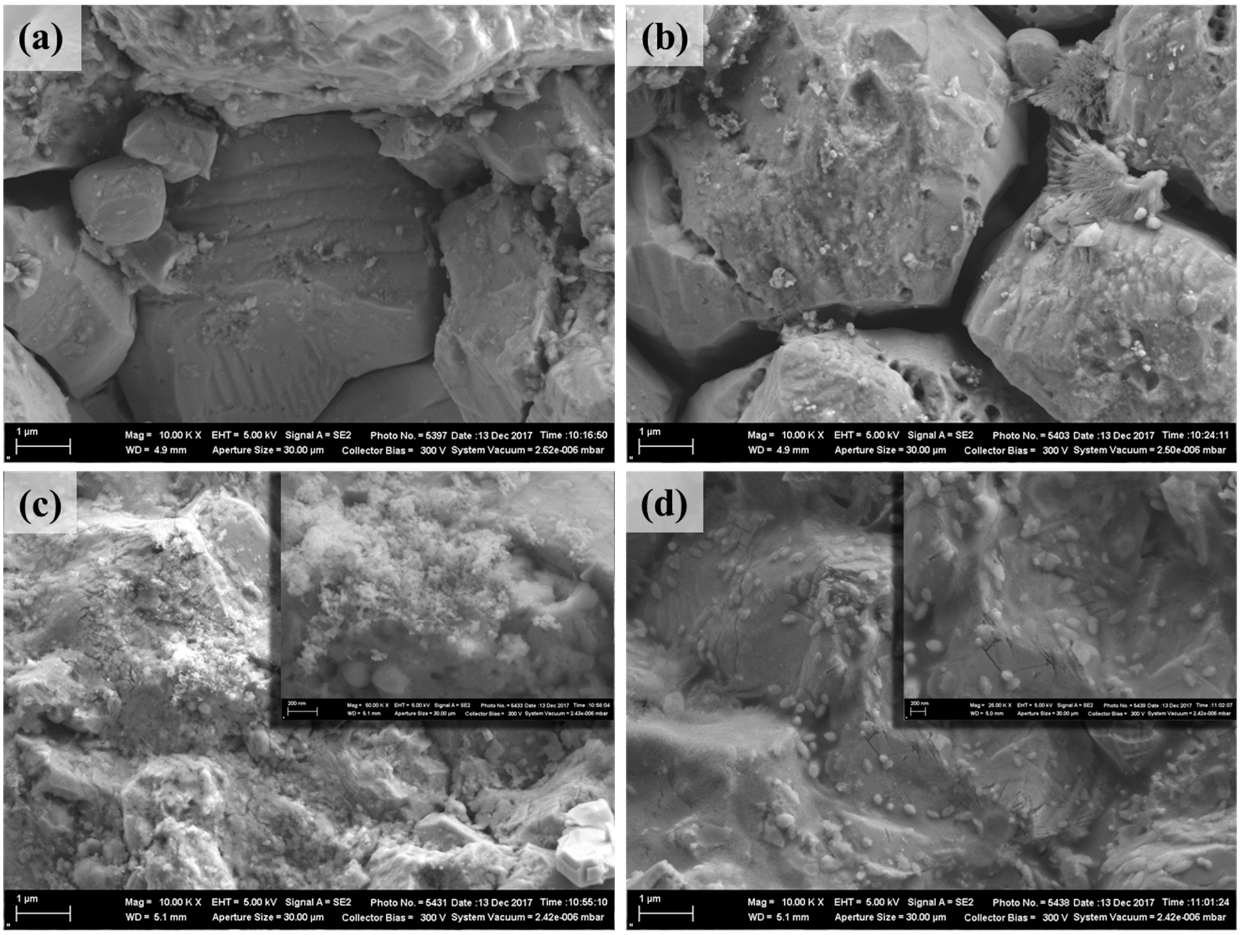

Figure S3. Images of the surface morphology for the as-sintered $(1–x)Sr_2Mg_{0.25}Ni_{0.75}MoO_{6–\delta}$ + xNiO ceramic materials at high magnification: x = 15 (a), x = 30 (b), x = 70 (c) and x = 85 (d).

Table S1. Total conductivity of Mg-based molybdate materials with a double perovskite structure at 800 °C in reducing atmospheres.

Material	$\sigma_{@800\ °C}$, S cm^{-1}	Conditions	Reference
Sr_2MgMoO_6	0.46	In 100 ppm H_2S/H_2 environment	[S1]
$BaSrMgMoO_6$	5.32		
Ba_2MgMoO_6	3.92		
Sr_2MgMoO_6	0.8	5%H_2/Ar	[S2]
Sr_2MgMoO_6	0.3	5%H_2/Ar	[S3]
Sr_2MgMoO_6	8.6	5%H_2/Ar	[S4]

References

[S1] Howell, T.; Kuhnell, C.; Reitz, T. A_2MgMoO_6 (A = Sr, Ba) for use as sulfur tolerant anodes. *J. Power Sources* **2013**, *231*, 279–284.

[S2] Marrero-López, D.;Peña-Martínez, J.; Ruiz-Morales, J.C.; Gabás, M.; Núñez, P.; Aranda, M.A.G.; Ramos-Barrado, J.R. Redox behaviour, chemical compatibility and electrochemical performance of $Sr_2MgMoO_{6-\delta}$ as SOFC anode. *Solid State Ionics* **2010**, *180*, 1672–1682.

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[S4] Kong, L.; Liu, B.; Zhao, J.; Gu, Y.; Zhang, Y. Synthesis of nano-crystalline $Sr_2MgMoO_{6-\delta}$ anode material by a sol–gel thermolysis method. *J. Power Sources* **2009**, *188*, 114–117.