Highly Crystalline Ni/NiO Hybrid Electrodes Processed by Inkjet Printing and Laser-Induced Reductive Sintering under Ambient Conditions

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S1. Summary of comparing existing solution-processed Ni or NiO thin film deposition methods along with their respective performance in literature

Author	Material	Process	Designated electrode	Feature Resolution (L: line width, F: film thickness)	Specific Resistivity (nΩ·m)
Liu et al.[1*]	Ni ion precursor	Spin coating [a] Oven sintering [b]	NiO	L: not applicable F: ~ 40 nm	None
Huang et al.[2*]	50 nm NiO particles	Inkjet printing [a]	NiO	L: not reported F: ~ 16 μm	1.13×10^{11}
Li et al.[3*]	Ni ion precursor	Reactive inkjet printing [a]	Ni	L: ~ 200 μm F: 5–10 μm	4.62×10^{4}
Lee et al.[4*]	3 nm NiO particles	Spin coating [a] Laser reductive sintering [b]	Ni	L: 6.5 μm F: 35–40 nm	6.30×10^{2}
This work	3 nm NiO particles	Inkjet printing [a] NiO: Oven Sintering [b] Ni: Laser reductive sintering [b]	NiO or Ni	NiO: L: ~ 50 μm, F: ~ 300 nm Ni: L: ~ 5 μm, F: ~100 nm (single line)	Ni: 1.03×10^{3}

[a] Material deposition method

[b] Subsequent annealing method

* The reference is also cited in the main manuscript.

1. S. Liu, R. Liu, Y. Chen, S. Ho, J. H. Kim and F. So, *Chemistry of Materials*, 2014, **26**, 4528-4534.
2. C.-C. Huang, Z.-K. Kao and Y.-C. Liao, *ACS Applied Materials & Interfaces*, 2013, **5**, 12954-12959.
3. D. Li, D. Sutton, A. Burgess, D. Graham and P. D. Calvert, *Journal of Materials Chemistry*, 2009, **19**, 3719-3724.
4. D. Lee, D. Paeng, H. K. Park and C. P. Grigoropoulos, *ACS Nano*, 2014, **8**, 9807-9814.