

Supplementary data

Efficient tri-metallic oxides for oxygen evolution reaction

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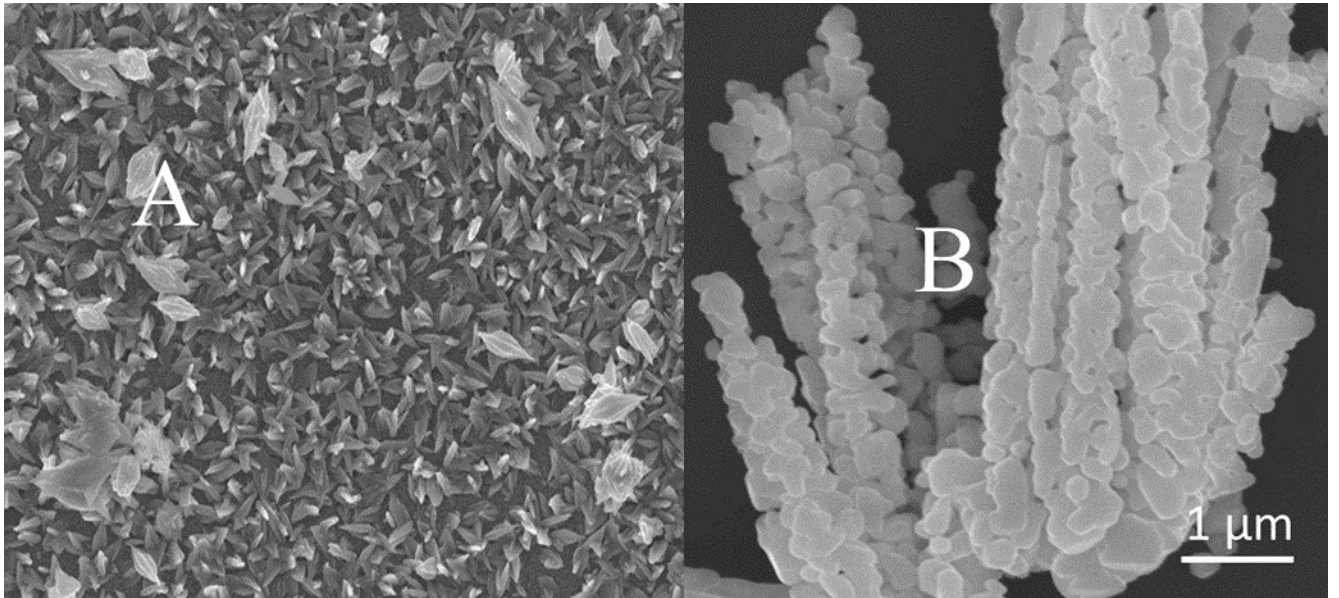
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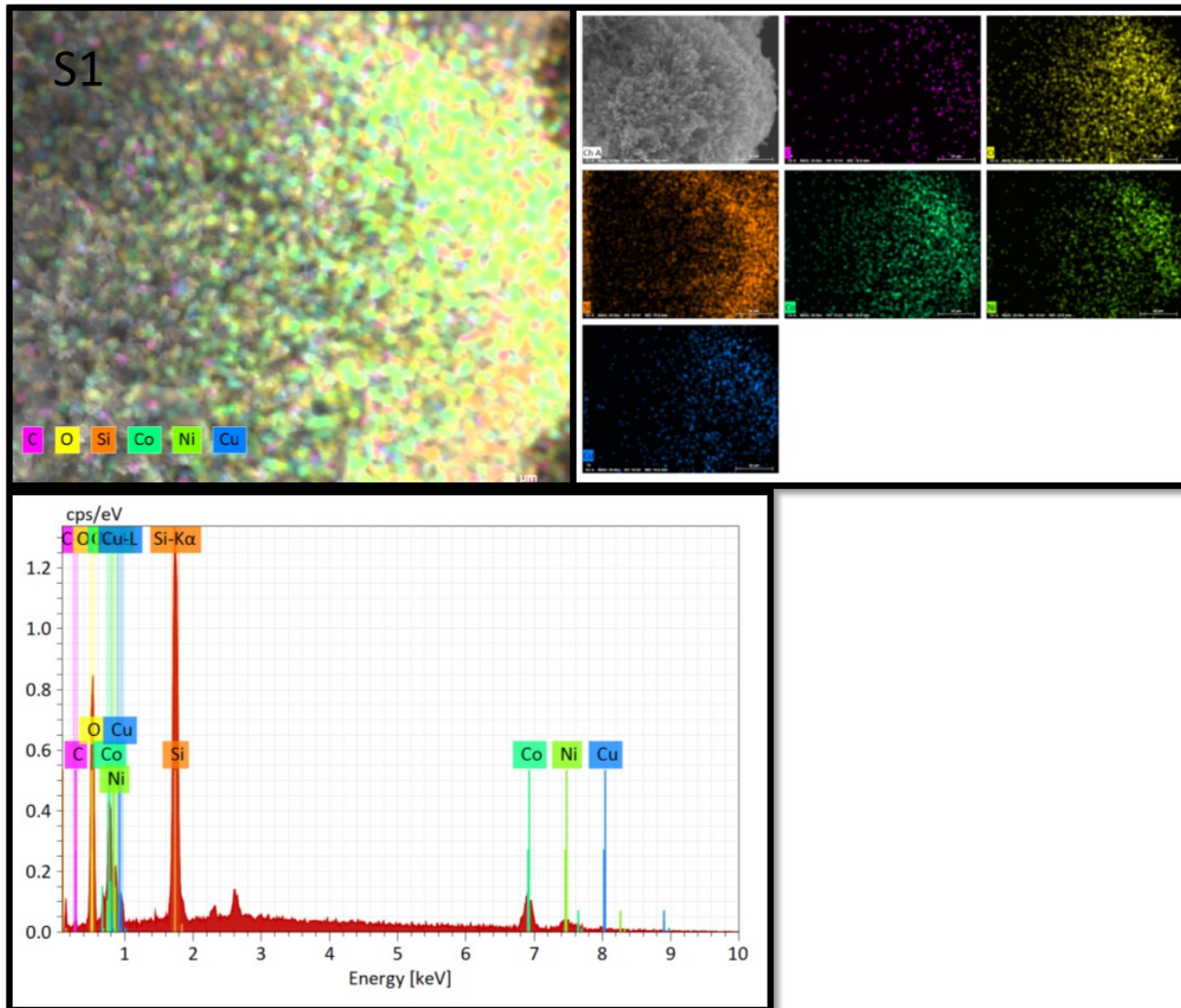
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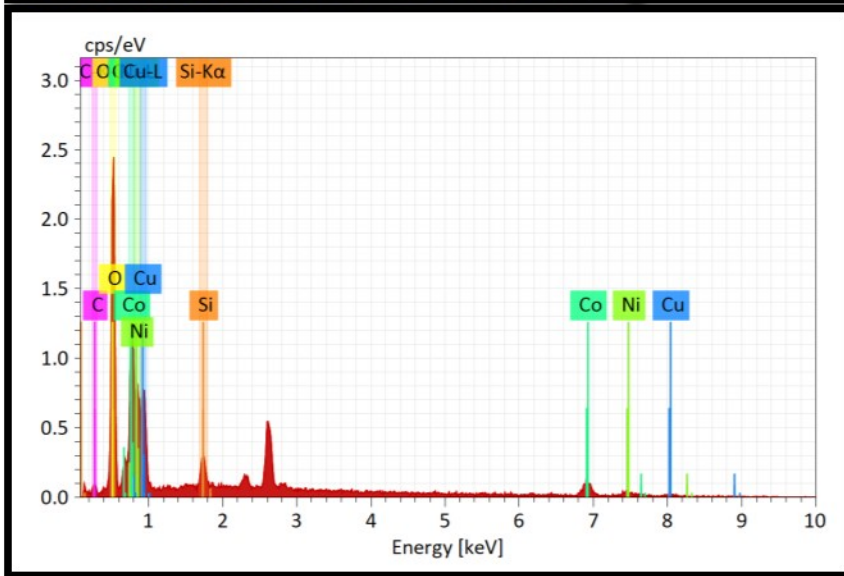
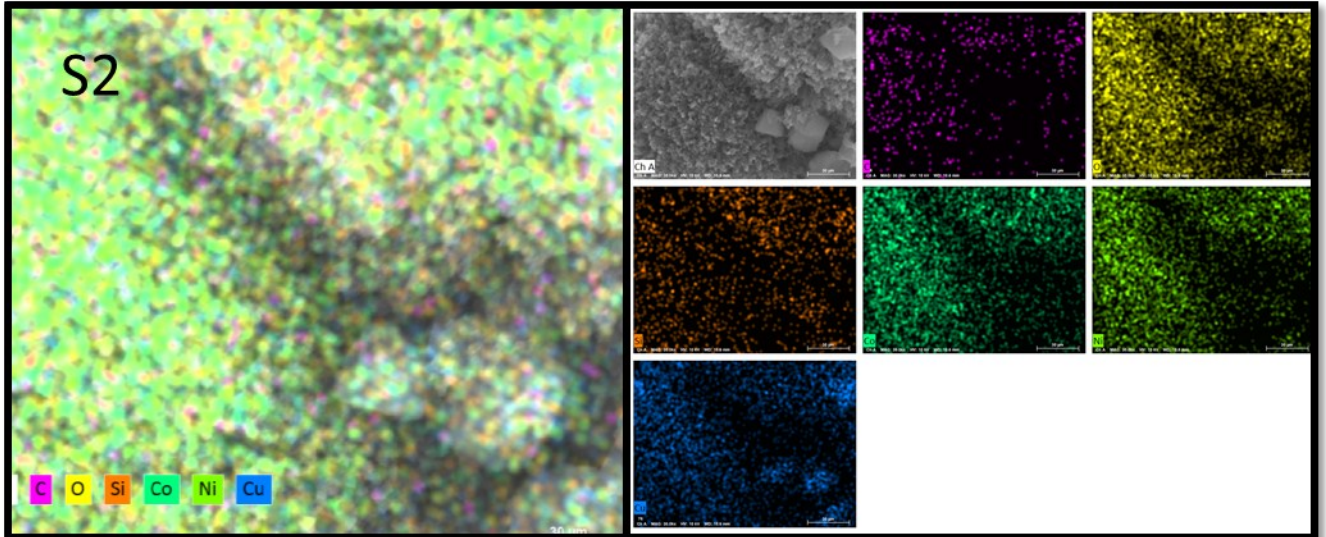
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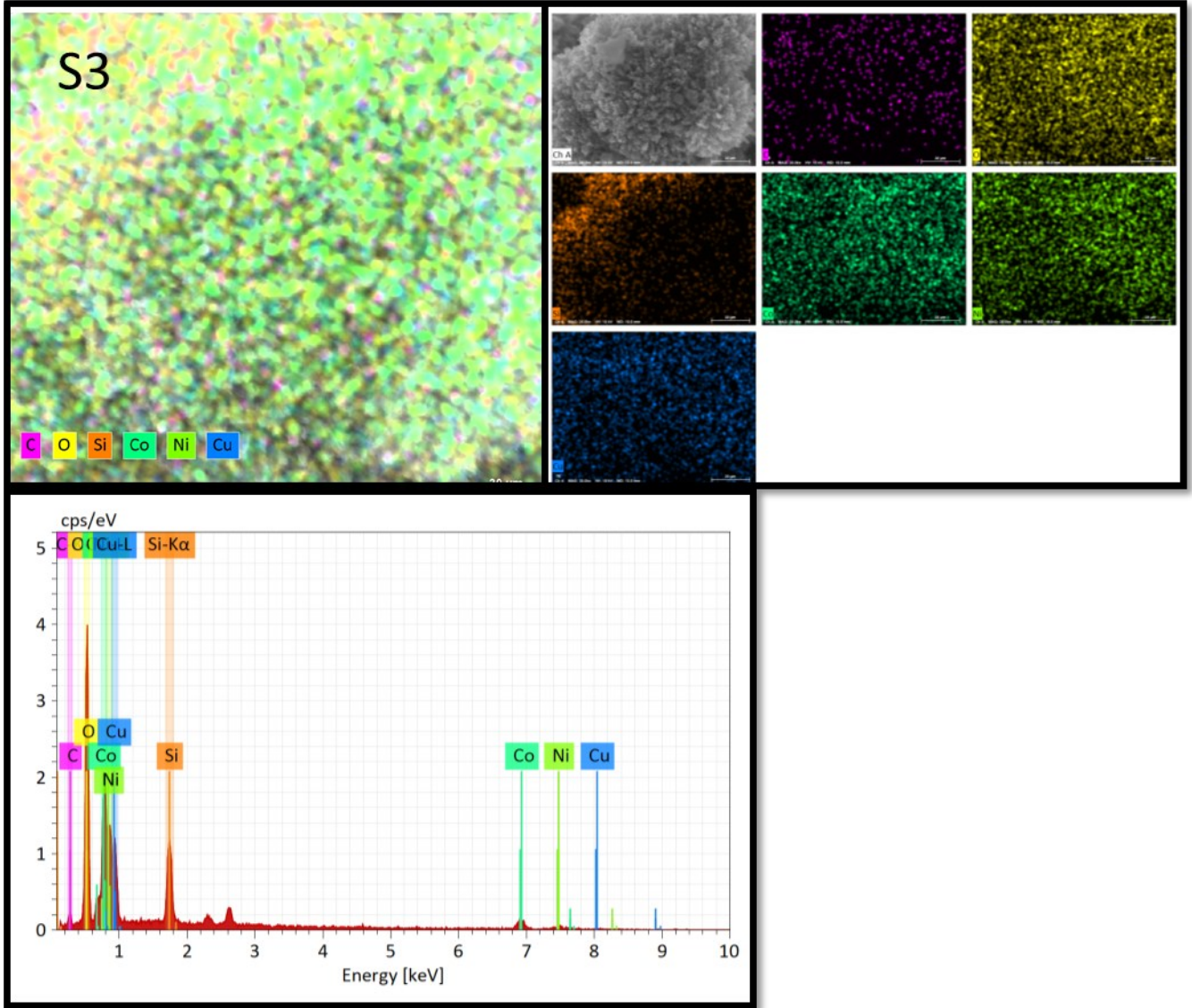
S1:(A) pristine CuO, (B) pristine NiCo₂O₄



S2:







S3: shows the equivalent circuit model for the impedance analysis

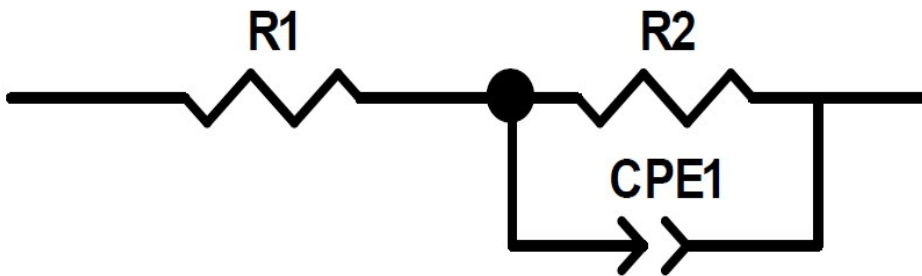


Table S1: Comparison of OER performance-based oxide electrocatalysts in alkaline media with recently reported works.

Catalyst	Tafel slope (mVdec ⁻¹)	Overpotential (V) @ 10 mA/cm ²	References.
CoCo LDH	59	393	1
CoOx@CN	N/A	~385	2
Co-P films	47	345	3
MnCo ₂ Ox	84	>410	4
Co ₃ O ₄ /N-rmGO	67	310	5
NiCoOx	N/A	420	6
N-G-CoO	71	340	7
Ni _x Co _{3-x} O	59~64	~370	8
NiCo ₂ O ₄ /CuO	94	230	Present work

References

1. F. Song and X. Hu J. Nature Communications 2014, 5, 4477.
2. H. Jin, J. Wang, D. Su, Z. Wei, Z. Pang and Y. Wang J. Am. Chem. Soc. 2015, 137, 7, 2688-2694.
3. N. Jiang D. B. You and M. Sheng, J. Angewandte Chemie. 2015, 18, 6251-6254
4. F. Song and X. Hu J. Am. Chem. Soc., 2014, 1364716481-16484.
5. Y. Liang, Y. Li, H. Wang, J. Zhou, J. Wang and T. Regier J. Nature Materials, 2011, 10, 780–786.
6. C. C. L. McCrory, S. Jung, J. Peters J. Am. Chem. Soc., 2013, 26-28.
7. X. Cui, P. Ren, D. Deng, J. Deng and X. Bao, J. Energy Environ. Sci., 2016, 9, 123-129.
8. Y. Li, P. Hasin Y. Li and P. Hasin J. advanced materials., 2010, 4, 1926-1929.