

Electronic Supplementary Information

Cogeneration of ethylene and electricity in symmetrical protonic solid oxide fuel cells based on $\text{La}_{0.6}\text{Sr}_{0.4}\text{Fe}_{0.8}\text{Nb}_{0.1}\text{Cu}_{0.1}\text{O}_{3-\delta}$ electrode

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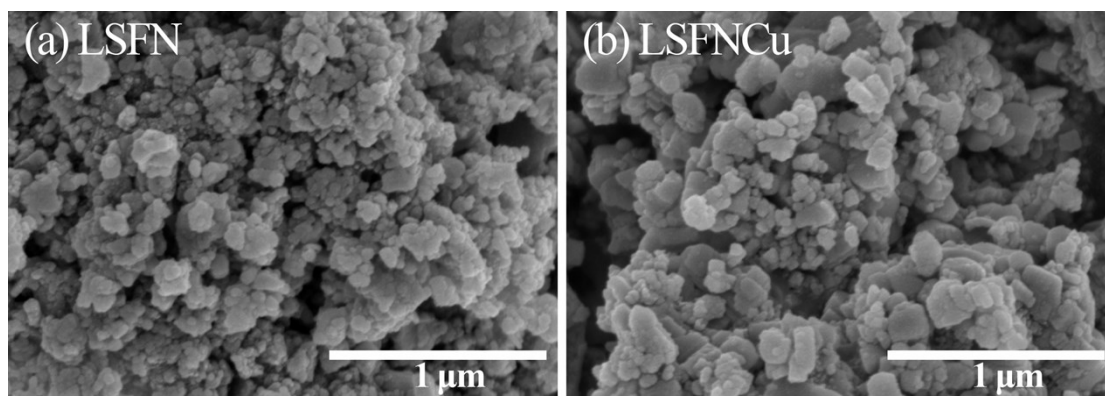


Fig. S1. SEM micrograph of as-prepared (a) LSFN and (b) LSFNCu powders.

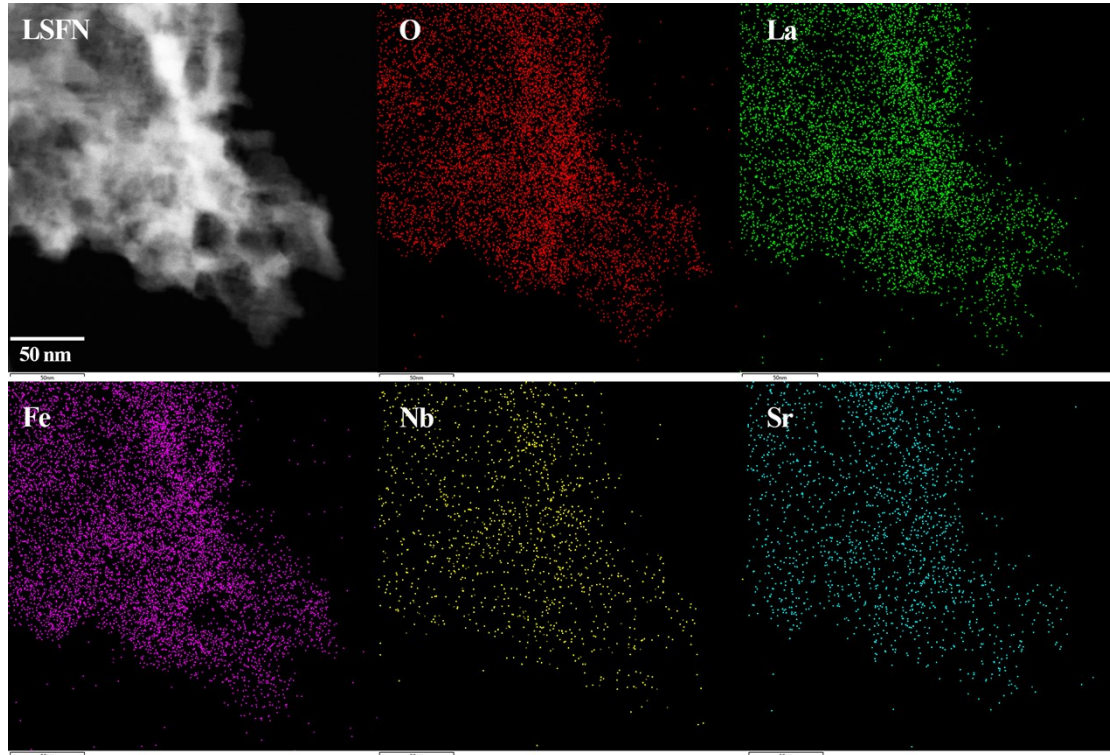


Fig. S2. The TEM image of LSFN powder and the corresponding energy dispersive X-ray spectroscopy (EDS) mapping images about O, La, Fe, Nb and Sr elements.

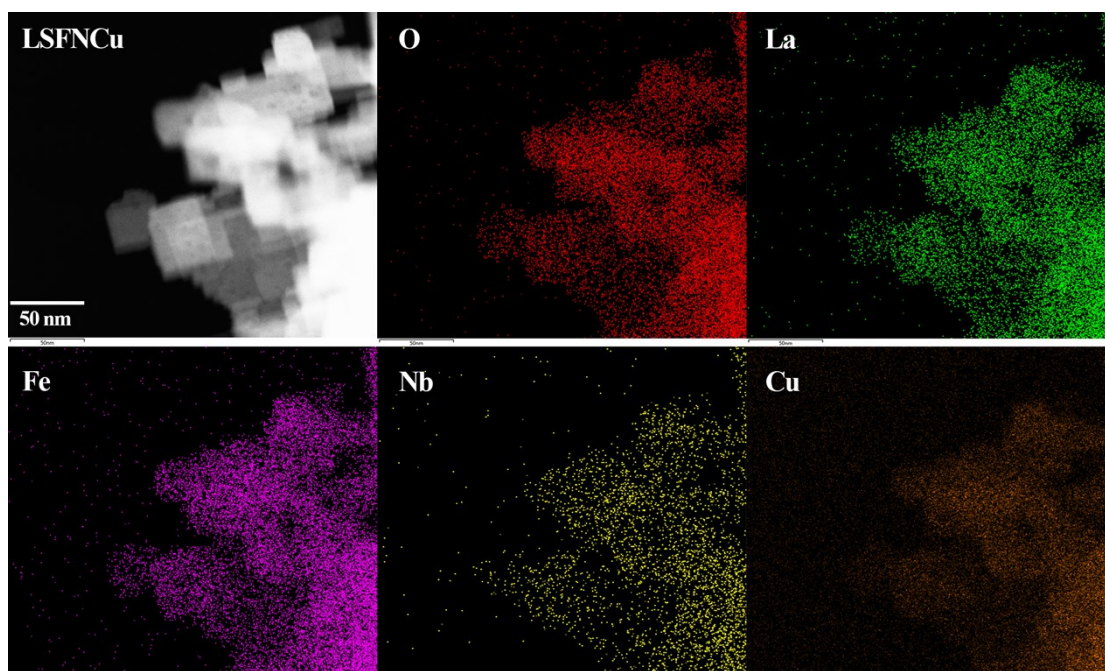


Fig. S3. The TEM image of LSFNCu powder and the corresponding energy dispersive X-ray spectroscopy (EDS) mapping images about O, La, Fe, Nb and Cu elements.

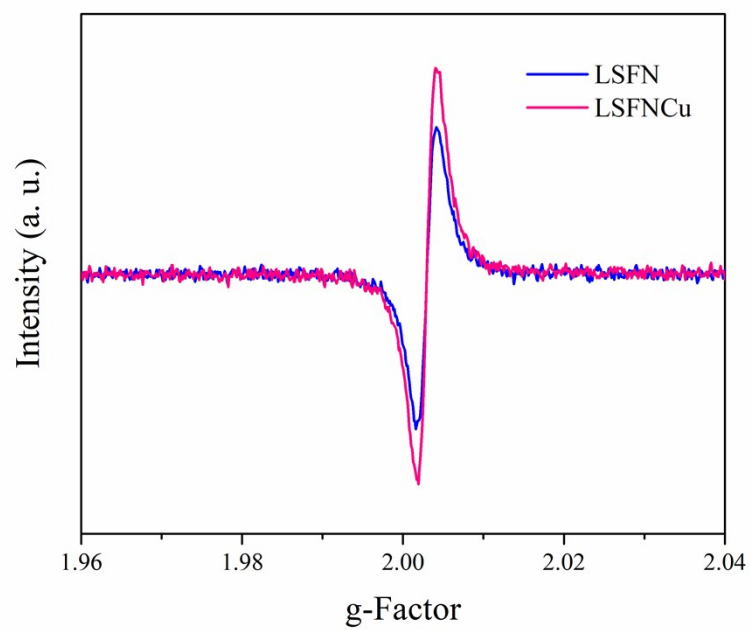


Fig. S4. Electron paramagnetic resonance (EPR) patterns of the LSFN and LSFNCu.

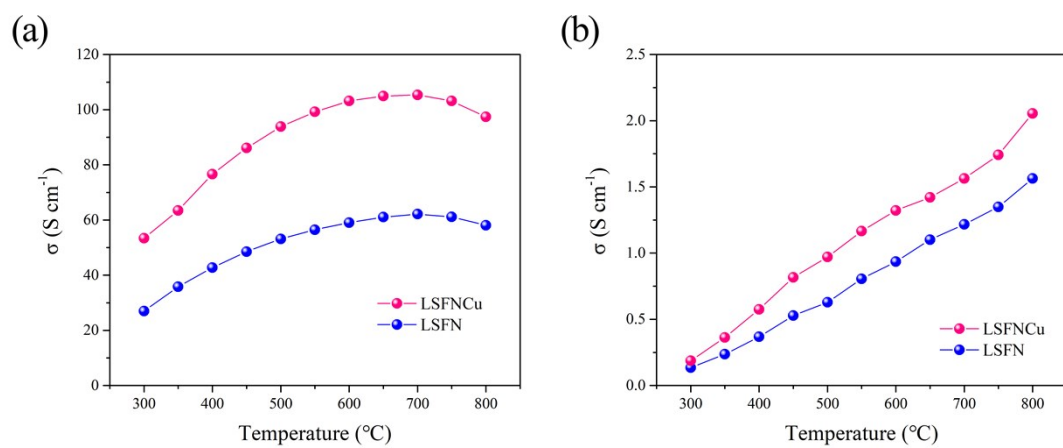


Fig. S5. Electrical conductivity of the LSFN and LSFNCu in air (a) and 5% H_2 -Ar (b).

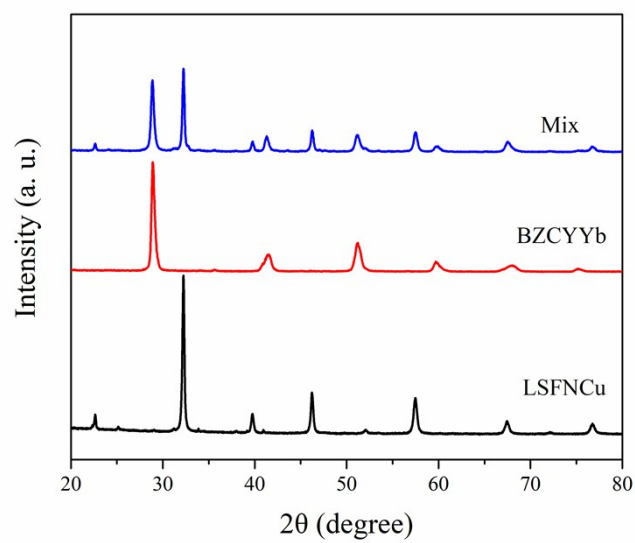


Fig. S6. XRD patterns of LSFNCu, BZCYYb and LSFNCu-BZCYYb mixed powder sintered at 1000 °C for 4 h.