

Electronic Supplementary Information

**High Temperature Reduction Cleaning (HTRC) Process: A Novel Method for Conductivity Recovery of Yttrium-doped Barium Zirconate Electrolyte**

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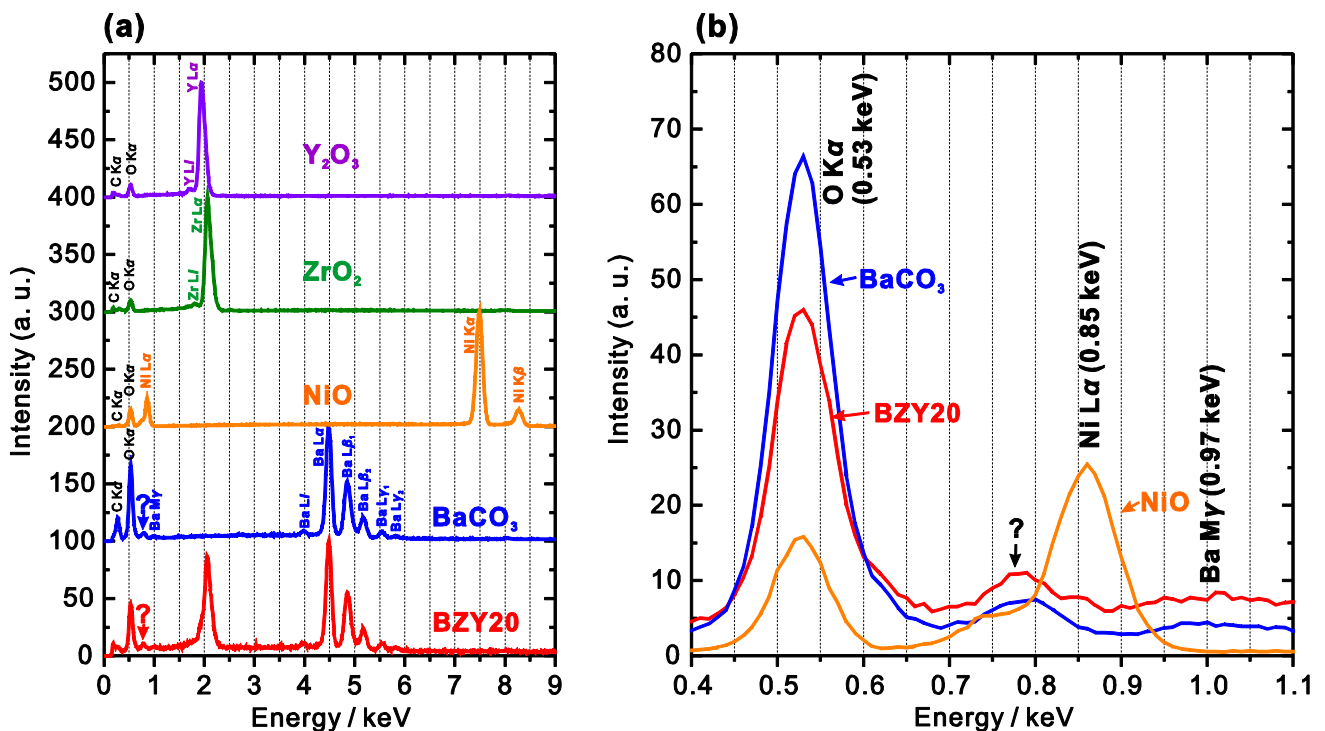
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In order to identify the peak that appeared at 0.78 keV, powder samples of BZY20 (without NiO additive), BaCO<sub>3</sub>, ZrO<sub>2</sub>, Y<sub>2</sub>O<sub>3</sub> and NiO were subjected to SEM-EDS analysis with Genesis-XM2 (EDAX, Mahwah, NJ) attached to a scanning electron microscope (SEM, VE-7800, Keyence Co., Osaka, Japan). The spectra are shown in **Fig. S1(a)**. For close examination the area between 0.4 and 1.1 keV is magnified in **Fig. S1(b)** for BZY20, BaCO<sub>3</sub> and NiO. It is clear that the spectrum of BaCO<sub>3</sub> also has a peak around 0.78 keV in agreement with that of BZY20. Thus the peak at 0.78 keV can be attributed to barium, and not other elements including nickel.



**Fig. S1** (a) SEM-EDS spectra of powder samples of BZY20 (without NiO additive) and the raw materials of BaCO<sub>3</sub>, ZrO<sub>2</sub>, Y<sub>2</sub>O<sub>3</sub> and NiO; (b) enlarged spectra of BZY20, BaCO<sub>3</sub> and NiO in the energy range between 0.4 and 1.1 keV.