



## Supporting Information

Insights into the trade-off between oxygen reduction reaction activity and CO<sub>2</sub> stability in cation doped Ba<sub>0.9</sub>Co<sub>0.7</sub>Fe<sub>0.3</sub>O<sub>3-δ</sub> perovskite cathode for solid oxide fuel cells

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Figure S1

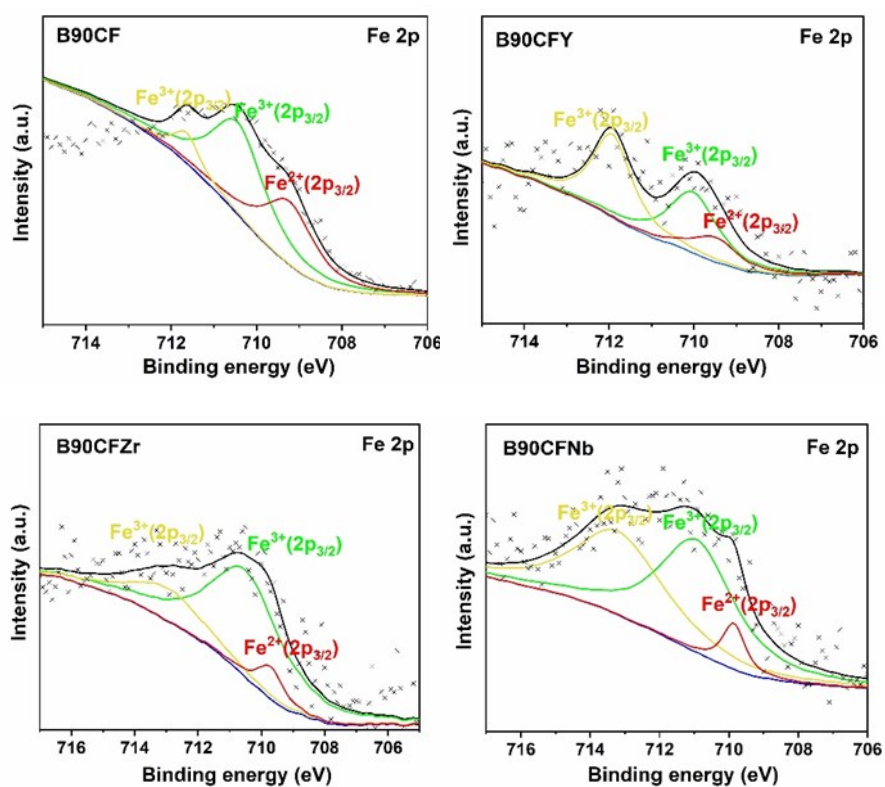


Fig. S1 XPS spectra of Fe atoms in B90CF and B90CFM (M= Zr, Nb, Y)

## Figure S2

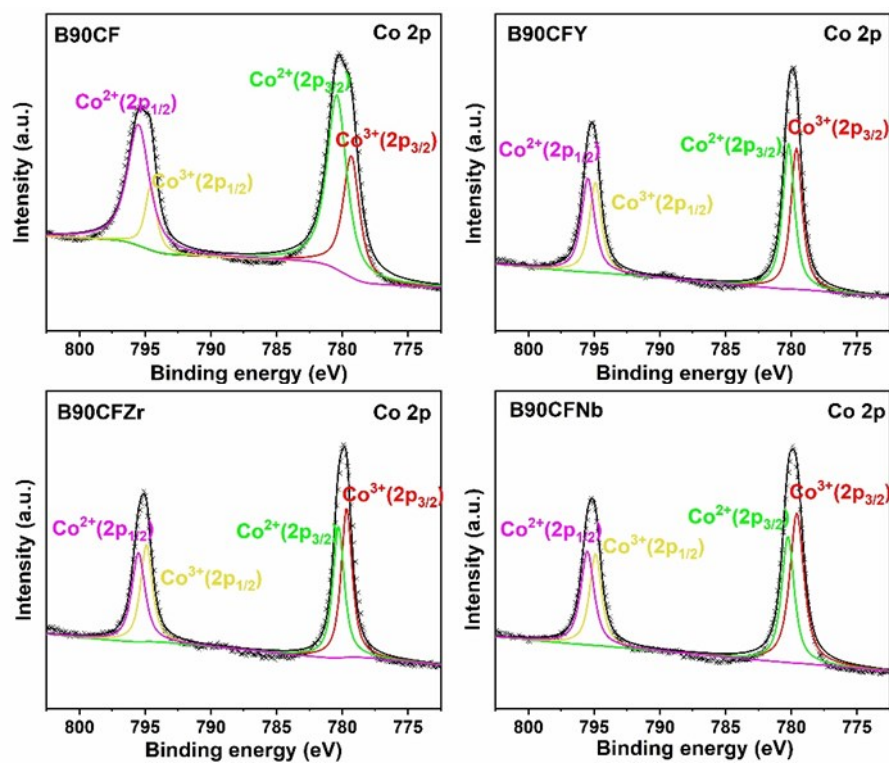


Fig. S2 XPS spectra of Co atoms in B90CF and B90CFM (M= Zr, Nb, Y)

**Table S1**

Table S1 Reitveld refinement results of B90CFZr, B90CFNb and B90CFY

Sample	Structure	Space group	Lattice parameters				$R_p(\%)$	$R_w(\%)$	$\chi^2$
			$a$ (Å)	$b$ (Å)	$c$ (Å)	$V$ (Å <sup>3</sup> )			
B90CFZr	cubic	<i>Pm-3m</i>	4.0841	4.0841	4.0841	68.12	12.22	9.22	0.3639
B90CFNb	cubic	<i>Pm-3m</i>	4.0714	4.0714	4.0714	67.49	11.60	8.50	0.3198
B90CFY	cubic	<i>Pm-3m</i>	4.0952	4.0952	4.0952	68.68	14.36	11.49	0.4448

**Table S2**

Table. S2 The wt% of each element obtained by surface scanning EDS test in the selected area of each sample shown in Figure 9

Sample	Element					
	Ba	Co	Fe	O	C	Zr
<b>B90CF before test</b>	51.68	16.67	6.15	22.10	3.40	
<b>B90CF after test</b>	47.72	13.87	4.84	26.73	6.83	
<b>B90CFZr before test</b>	54.81	14.85	4.69	19.12	3.65	2.88
<b>B90CFZr after test</b>	52.11	13.16	3.95	24.05	4.21	2.52

**Table S3**

Tab. S3 Comparison of single cell peak power density between B90CFZr and B90CF

Sample	Peak Power Density (mW cm <sup>-2</sup> )		
	600°C	650°C	700°C
<b>B90CF</b>	418	561	682
<b>B90CFZr</b>	394	543	667