

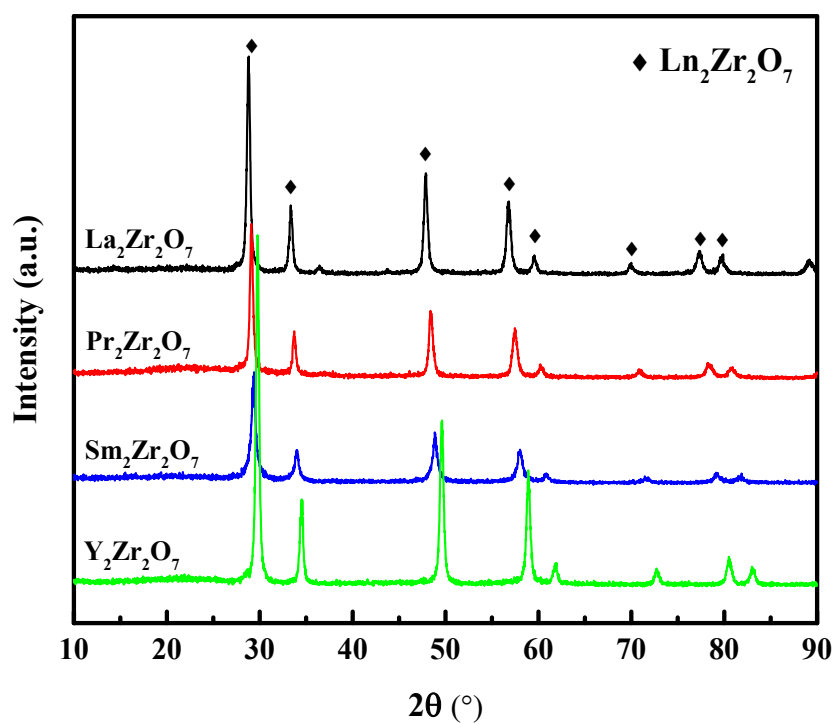
## Supporting Information

### Ni/Ln<sub>2</sub>Zr<sub>2</sub>O<sub>7</sub> (Ln=La, Pr, Sm and Y) catalysts for methane steam reforming: on the effects of A site replacement

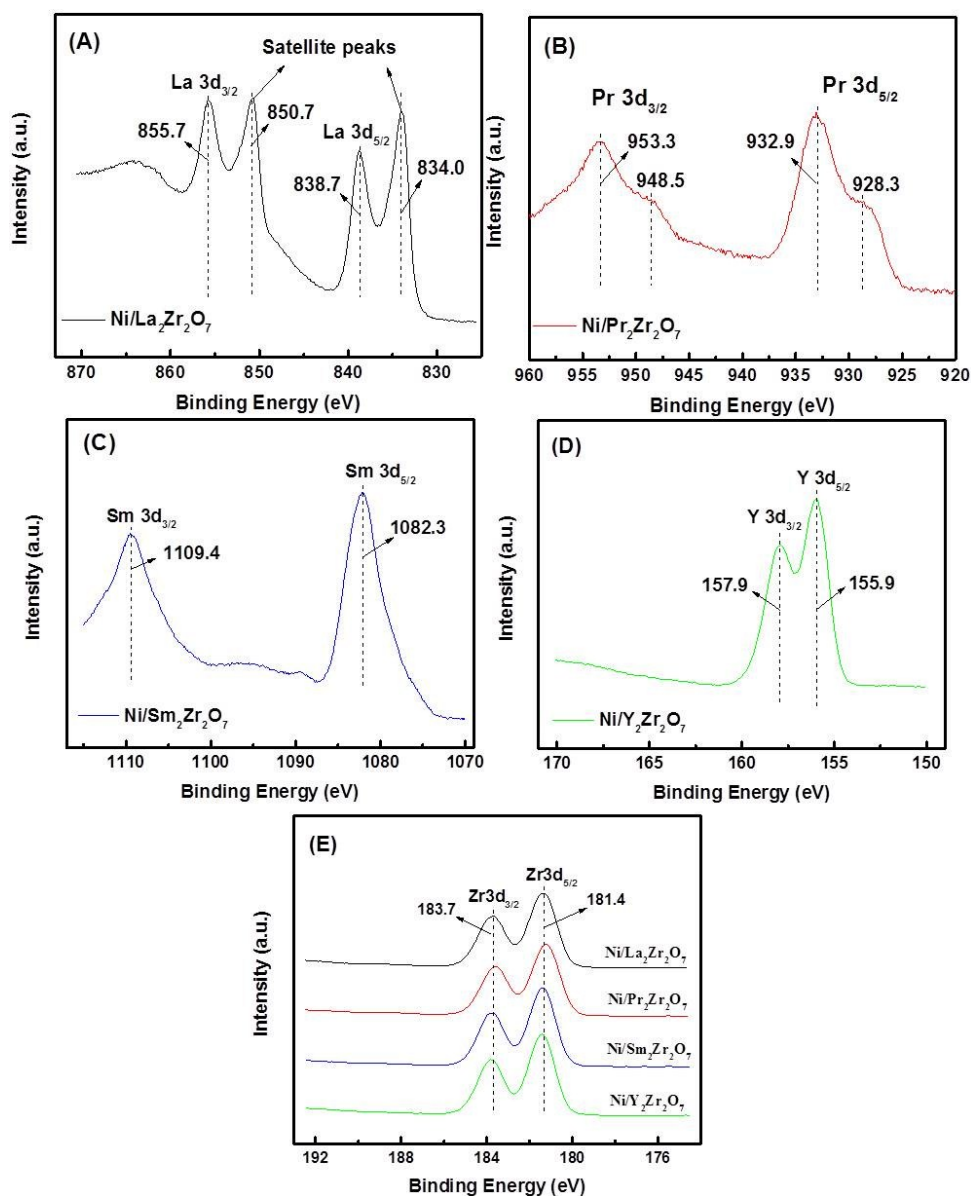
Xianhua Zhang<sup>†,a</sup> Xiuzhong Fang<sup>†,a</sup> Xiaohui Feng,<sup>a</sup> Xiao Li,<sup>a</sup> Wenming Liu,<sup>a</sup> Xianglan Xu,<sup>a</sup> Ning Zhang,<sup>a</sup> Zhixian Gao,<sup>b</sup> Xiang Wang<sup>a,\*</sup> Wufeng Zhou<sup>c</sup>

E-mail: xwang23@ncu.edu.cn

† These authors contribute equally to this work



**Fig. S1.** XRD patterns of the Ln<sub>2</sub>Zr<sub>2</sub>O<sub>7</sub> supports before calcination.



**Fig. S2.** XPS spectra of (A) La 3d, (B) Pr 3d, (C) Sm 3d, (D) Y 3d and (E) Zr 3d for the freshly reduced Ni/Ln<sub>2</sub>Zr<sub>2</sub>O<sub>7</sub> catalysts.

**Table S1.** The structural properties of the Ln<sub>2</sub>Zr<sub>2</sub>O<sub>7</sub> supports

Catalysts	before calcination		after calcination		after calcination	
	crystallite size (nm) <sup>a</sup>	surface area (m <sup>2</sup> /g) <sup>b</sup>	Crystallite size (nm) <sup>a</sup>	surface area (m <sup>2</sup> /g) <sup>b</sup>	hkl	d (Å)
La <sub>2</sub> Zr <sub>2</sub> O <sub>7</sub>	17.8	13	18	14	222	3.11
Pr <sub>2</sub> Zr <sub>2</sub> O <sub>7</sub>	19.1	13	18	13	222	3.08
Sm <sub>2</sub> Zr <sub>2</sub> O <sub>7</sub>	17.8	17	12	17	222	3.05
Y <sub>2</sub> Zr <sub>2</sub> O <sub>7</sub>	18.1	17	17	18	222	—

<sup>a</sup> Calculated from XRD results; <sup>b</sup> Determined by BET.