

## Supporting Information

### An Efficient Calcium-based Sorbent for Flue Gas Dry-Desulfurization:

### Promotion roles of Nitrogen Oxide and Oxygen

Kai-Qi Wang<sup>a</sup>, Xian-Ming Gao<sup>b</sup>, Bo Lin<sup>a\*</sup>, Dong-Xu Hua<sup>b</sup>, Yong Yan<sup>a</sup>, Hong-Yan Zhao<sup>b</sup> and Wen-De Xiao<sup>a\*</sup>

<sup>a</sup> School of Chemistry and Chemical Engineering, Shanghai Jiao Tong University, Shanghai 200240, P.R. China

<sup>b</sup> Henan Shenma Nylon Chemical Company, Ltd., Henan 467013, P.R. China

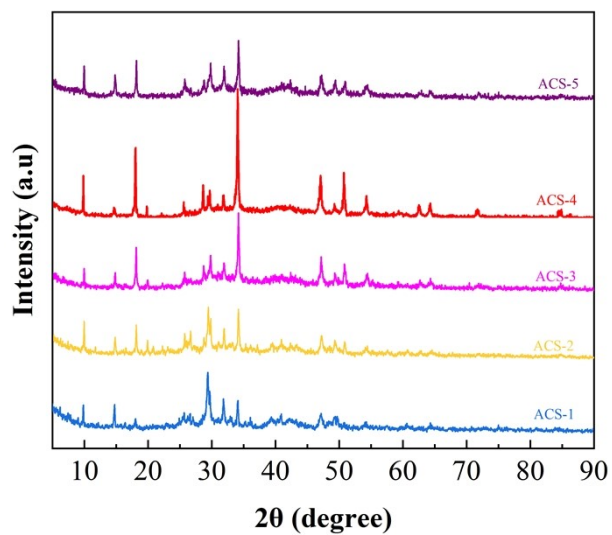
**Table S1** The composition and content of sorbents

Sorbent	Mass Ratio Fly ash/CaO/CaSO <sub>4</sub>	Fly ash (g)	CaO (g)	CaSO <sub>4</sub> (g)
ACS-1	2:1:1	25	12.5	12.5
ACS-2	1:1:2	12.5	12.5	25
ACS-3	1:1:1	12.5	12.5	12.5
ACS-4	1:2:1	6.25	12.5	6.25
ACS-5	1:3:1	4.2	12.5	4.2

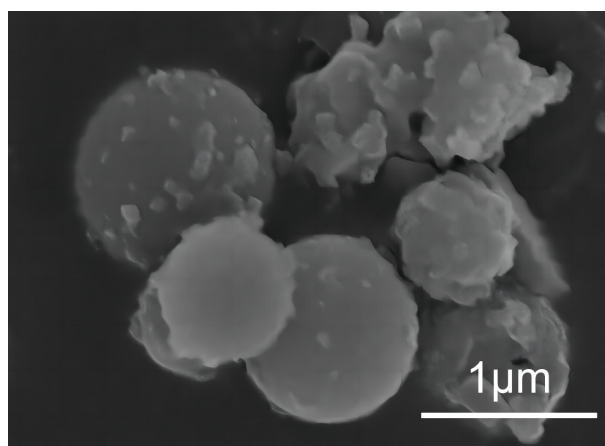
**Table S2** Major chemical composition of fly ash (wt%)

SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	CaO	Fe <sub>2</sub> O <sub>3</sub>	K <sub>2</sub> O	MgO	Na <sub>2</sub> O
48.49	36.14	2.35	5.71	1.71	1.53	1.37

**Fig. S1.** Nitrogen adsorption-desorption isotherms and pore-size distributions of ACS sorbents.



**Fig. S2.** XRD patterns of the as-synthesized sorbents.



**Fig. S3.** The fly ash morphology characterized by SEM

**Fig. S4.** The fresh ACS morphology characterized by SEM (a) ACS-1; (b) ACS-2; (c) ACS-3; (d) ACS-5.

**Fig.S5.** TGA curves of the different sorbents (a) ACS-1; (b) ACS-2; (c) ACS-3; (d) ACS-4;  
(e) ACS-5. ( $20\text{ }^{\circ}\text{C min}^{-1}$  under nitrogen)