Supporting information

Low-temperature selective catalytic reduction of NO_x with NH_3 over activated carbon-carbon nanotubes composite material prepared by *in-situ* method

Pengchen Wang,[a] Lu Yao,[a,b*] Yijuan Pu,[a] Lin Yang,[a,b] Xia Jiang,[a,b] Wenju Jiang[a,b,*]

[a] *College of Architecture and Environment, Sichuan University, Chengdu 610065, P.R. China*

[b] *National Engineering Research Center for Flue Gas Desulfurization, Chengdu 610065, P.R. China*

**Corresponding author. E-mail: yaolu@scu.edu.cn (L. Yao); wenjujiang@scu.edu.cn (W. Jiang); Tel: +86-28-8540 7800; Fax: +86-28- 8540 5613*

Figures

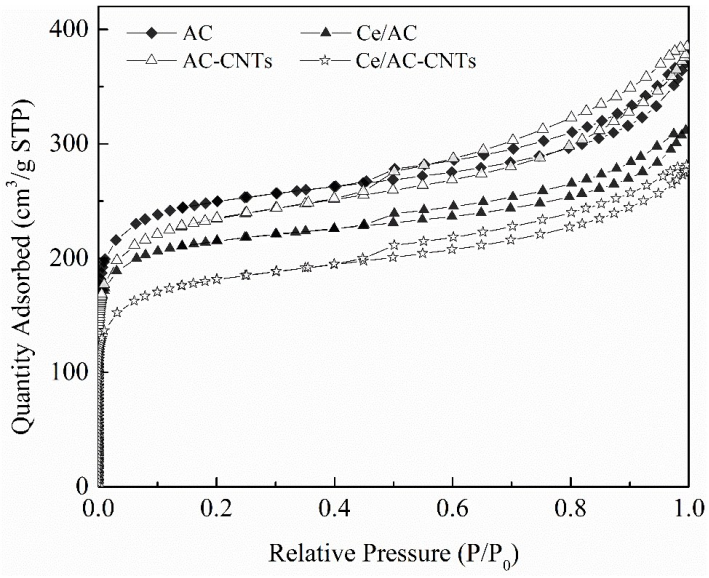

Fig. S1. N_2 adsorption-desorption isotherms of prepared samples.

The XRD patterns of AC, AC-CNTs Ce/AC and Ce/AC-CNTs were exhibited in Fig. S2. The wide diffraction peaks locating at 20-30 ° of graphite (002) were reflected the existence of graphite crystallite with layered structure (JCPDS 26-1079). The typical peaks of Ce/AC and Ce/AC-CNTs at

2θ = 28.6°, 47.5° and 56.3° corresponded to CeO_2 (JCPDS 34-0394) [1].

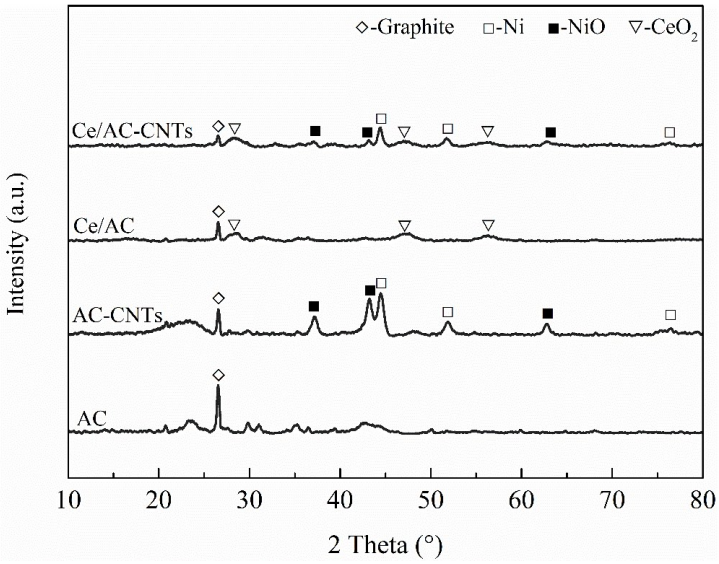

Fig. S2. XRD patterns AC, AC-CNTs, Ce/AC and Ce/AC-CNTs.

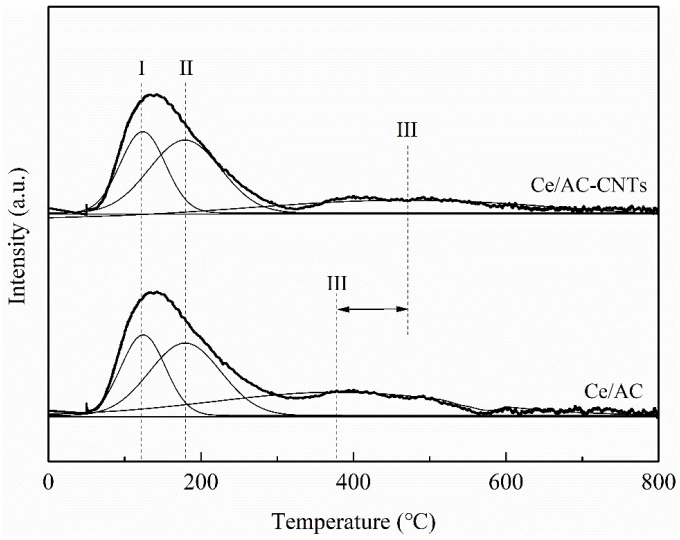

Fig. S3. NH_3-TPD profiles of Ce/AC and Ce/AC-CNTs.

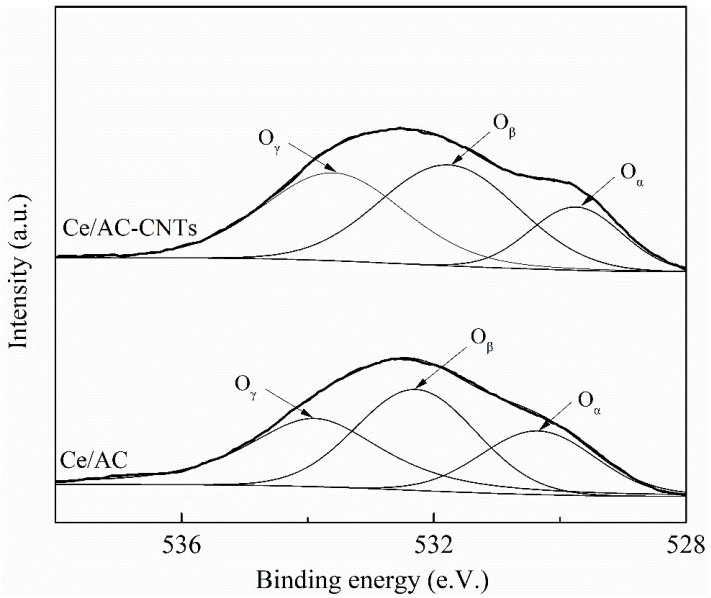

Fig. S4. XPS spectra of O 1s over the Ce/AC and Ce/AC-CNTs.

The Ce 3d spectra (Fig. S5) of Ce/AC and Ce/AC-CNTs can be separated into eight well-resolved bands, which could be classified into two groups of spin-orbital multiplets, denoted as "u" and "v", respectively [2]. The u′ band are resulted from Ce^{3+} ions, while the v′ bands are related to Ce^{4+} ions [3, 4], revealing the coexistence of Ce^{3+} and Ce^{4+} states in catalysts.

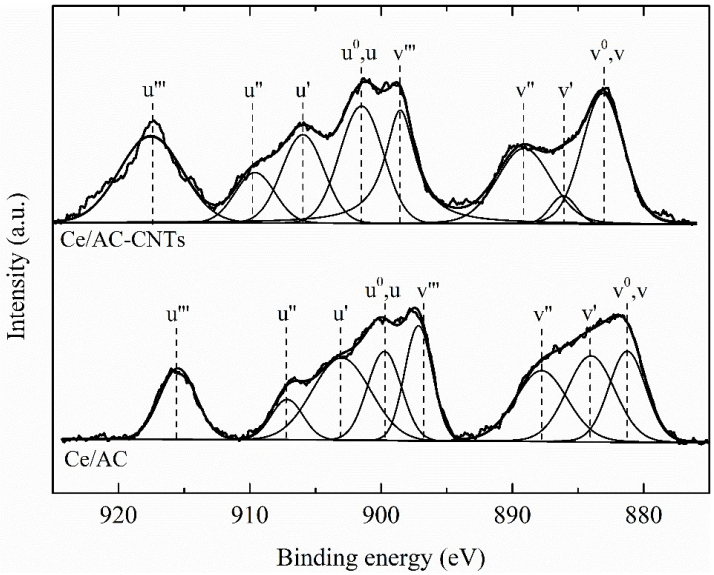

Fig. S5. XPS spectra of Ce 3d over the Ce/AC and Ce/AC-CNTs.

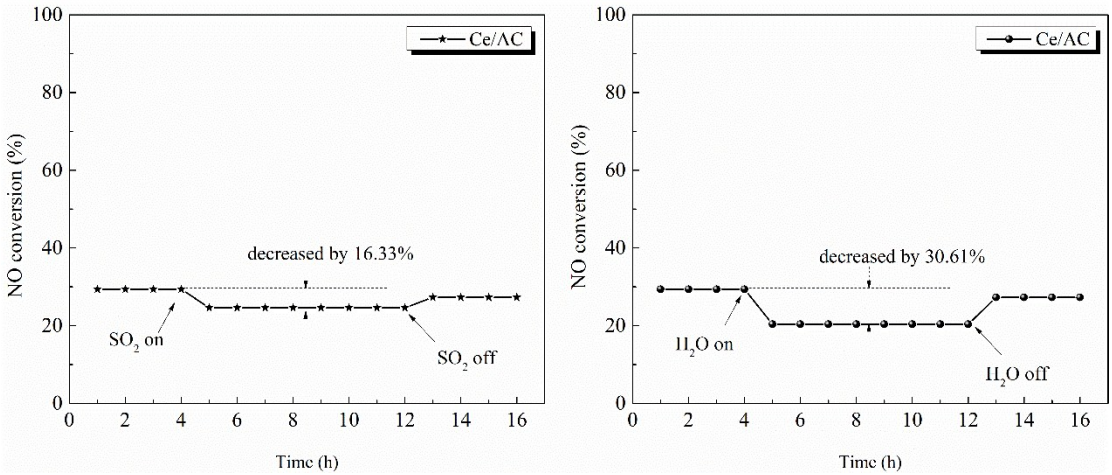

Fig. S6. SO_2 tolerance and water−resistance of Ce/AC over time.

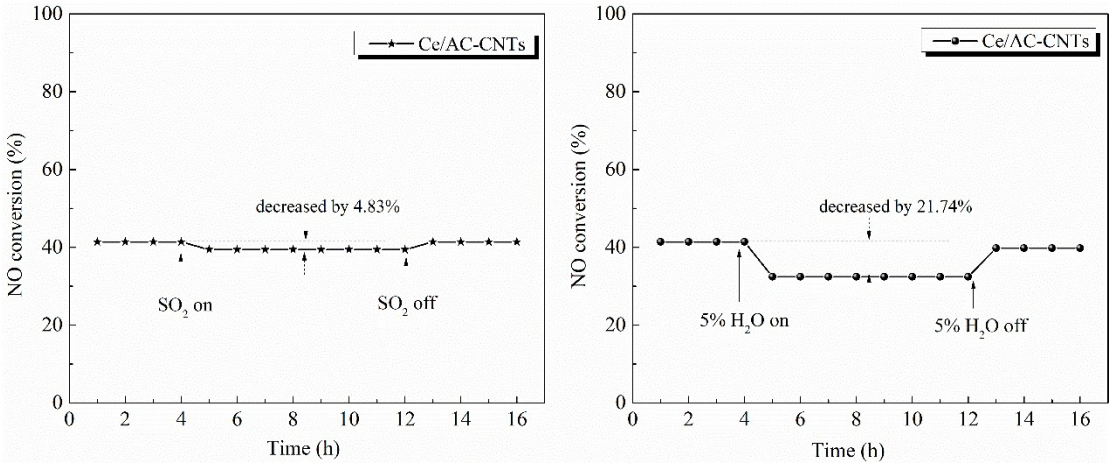

Fig. S7. SO_2 tolerance and water−resistance of Ce/AC-CNTs over time.

Tables

Table S1 Concentration of Ni found in bulk (by ICP) and surface (by XPS) of catalysts.

sample	ICP (%)	XPS (%)
AC-CNTs	9.25	0.81
Ce/AC-CNTs	9.28	0.88

Reference

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