Supplementary Materials

Construction of core-shell structure Cu-SSZ-13 catalyst for boosting its NH_3-SCR activity and hydrothermal stability

Wenting Lv[a,b,#], Fengmin Sun[a,#], Weiyong Jiao[c], Hongxia Zhao[d], Xia Li[d], Ruihua Zhang[a], Yanlu Guo[a], Jianfeng Jia[a,e,*], Baoliang Lv[a,b,*]

[a.] School of Chemistry and Materials Science, Shanxi Normal University, Taiyuan 030031, China

[b.] Shanxi Key Laboratory of Coal-based Synthetic Oil Product Testing, Changzhi, 046000, China

[c.] State Key Laboratory of Coal Conversion, Institute of Coal Chemistry, Chinese Academy of Sciences, Taiyuan 030001, China

[d.] Changzhi Comprehensive Inspection and Testing Center, Changzhi 046000, China

[e.] Shanxi University of Electronic Science and Technology, Linfen, 041000, China

*: Corresponding author

[#]: These authors contributed equally to this work

Corresponding author E-mail address: lvbl@sxnu.edu.cn; 20210125@sxnu.edu.cn

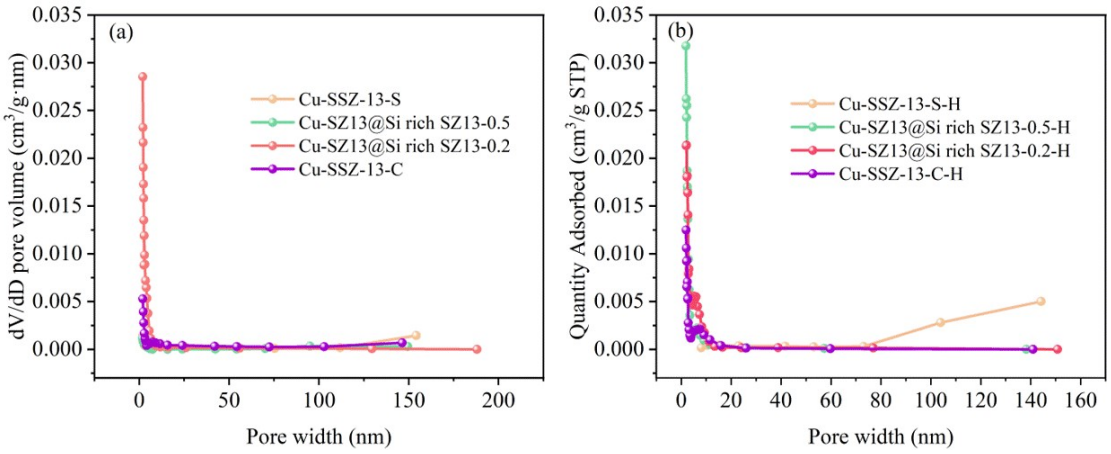

Fig. S1 BJH desorption pore size distributions derived from N_2 adsorption-desorption isotherms of (a) fresh catalysts and (b) aged catalysts.

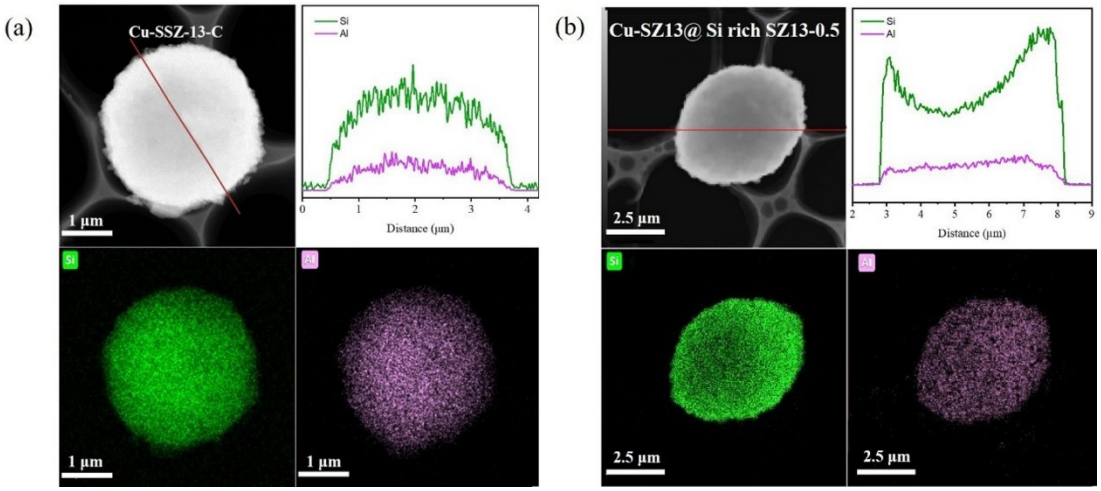

Fig. S2 HAADF, elementary line-scan spectra and HAADF-STEM element distribution mapping of Cu-SSZ-13-C (a) and Cu-SZ13@Si-rich SZ13-0.5 (b).

Table S1 Distribution results of Cu species in catalysts by XPS.

Samples	Cu^{2+}	CuO
Cu-SSZ-13-S	22.5%	77.5%
Cu-SZ13@ Si rich SZ13-0.5	22.1%	77.9%
Cu-SZ13@ Si rich SZ13-0.2	39.3%	60.7%
Cu-SSZ-13-C	33.3%	66.7%

Table S2 The hydrogen consumption of fresh catalysts detected by H_2-TPR.

Samples	$Cu^{2+}\rightarrow Cu^{+}$	$Cu^{+}\rightarrow Cu^{0}$
Cu-SSZ-13-S	0.011 mmol	0 mmol
Cu-SZ13@ Si rich SZ13-0.5	0.019 mmol	0.011 mmol
Cu-SZ13@ Si rich SZ13-0.2	0.016 mmol	0.017 mmol
Cu-SSZ-13-C	0.009 mmol	0.008 mmol

Table S3 N_2 physisorption results for the aged catalysts.

Samples	Specific surface area (m^2/g)	Pore volume (cm^3/g)		most probable pore radius (nm)
		Micropore volume(cm^3/g)	Total pore volume(cm^3/g)	
Cu-SSZ-13-S-H	524	0.27	0.39	1.82
Cu-SZ13@Si rich SZ13-0.5-H	401	0.20	0.22	1.81
Cu-SZ13@Si rich SZ13-0.2-H	406	0.21	0.25	1.87
Cu-SSZ-13-C-H	149	0.07	0.1	1.83