Supplementary File

Revealing the nature of crystal size on high-temperature hydrothermal stability of Cu/SSZ-13 NH_3-SCR catalysts

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# Huabo Liu and Chen Wang contributed equally to this manuscript.

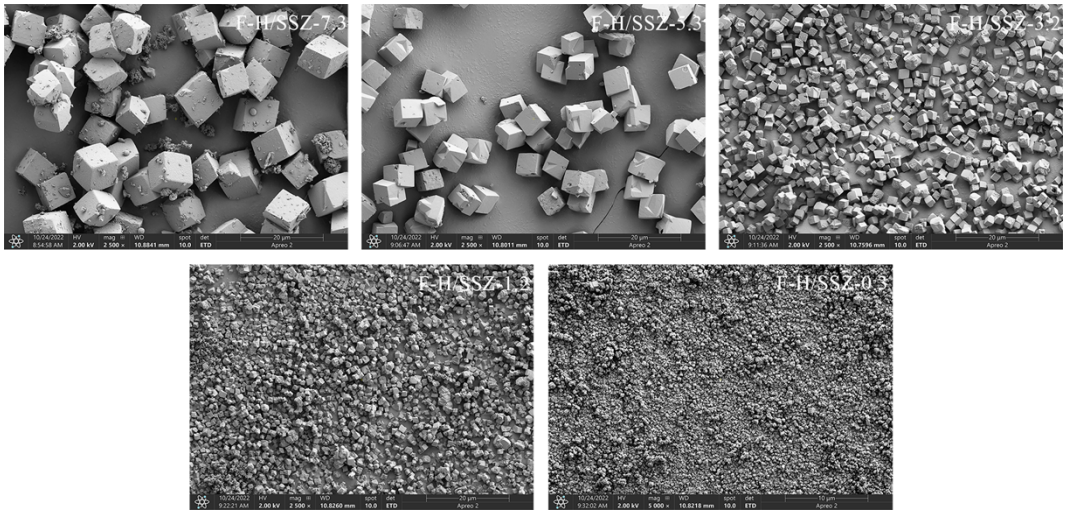

Figure S1. SEM images of fresh H-SSZ-13 samples with different crystal size

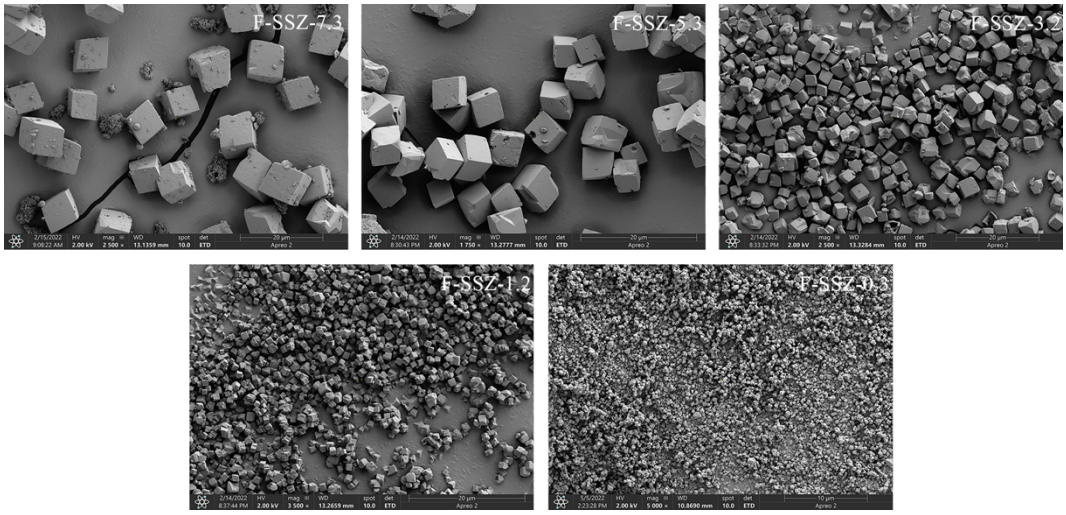

Figure S2. SEM images of fresh Cu-SSZ-13 samples with different crystal size

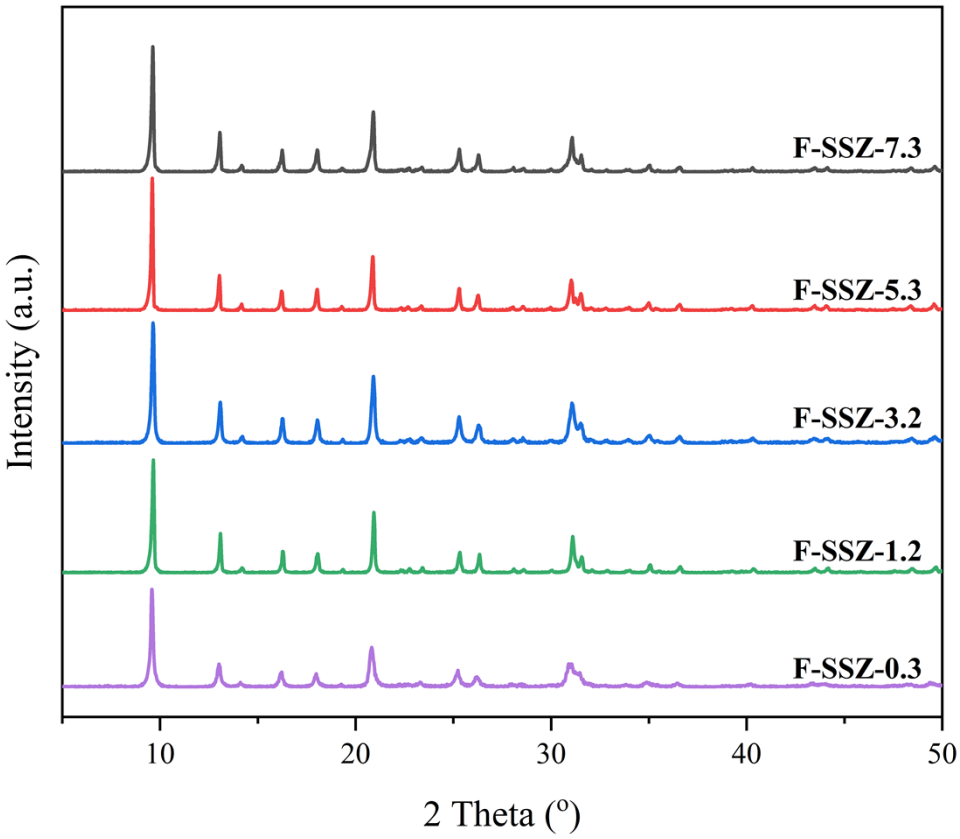

Figure S3. XRD patterns of fresh catalysts in the range of 5-50°.

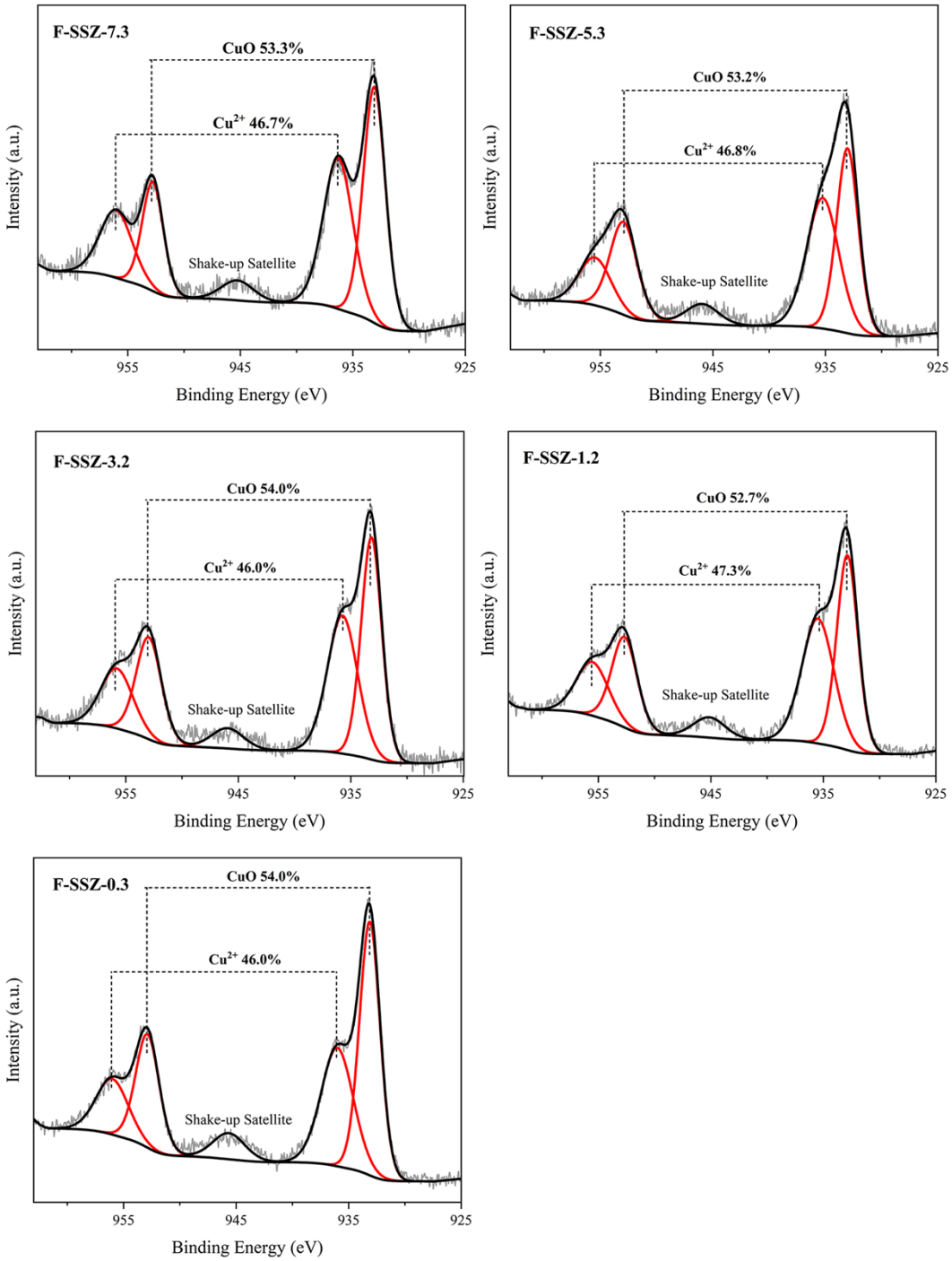

Figure S4. The deconvolution curves of Cu 2P XPS spectra for all fresh Cu/SSZ-13 catalysts

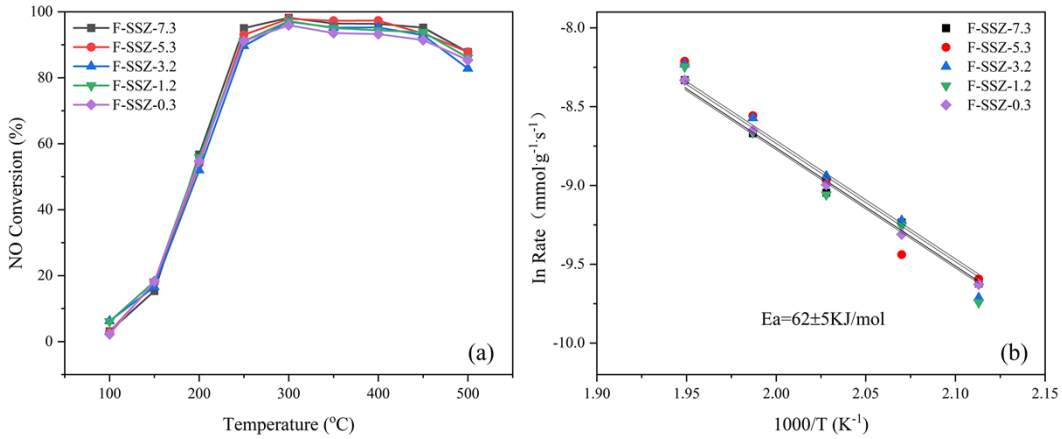

Figure S5. (a) Standard NH_3-SCR performance (500 ppm NO, 500 ppm NH_3, 5% O_2, 7% CO_2, 3% H_2O balanced with N_2.) of fresh Cu/SSZ-13 catalysts. (b) SCR rate (500 ppm NO, 500 ppm NH_3, 5% O_2, 3% H_2O balanced with N_2) of fresh Cu/SSZ-13 catalysts.

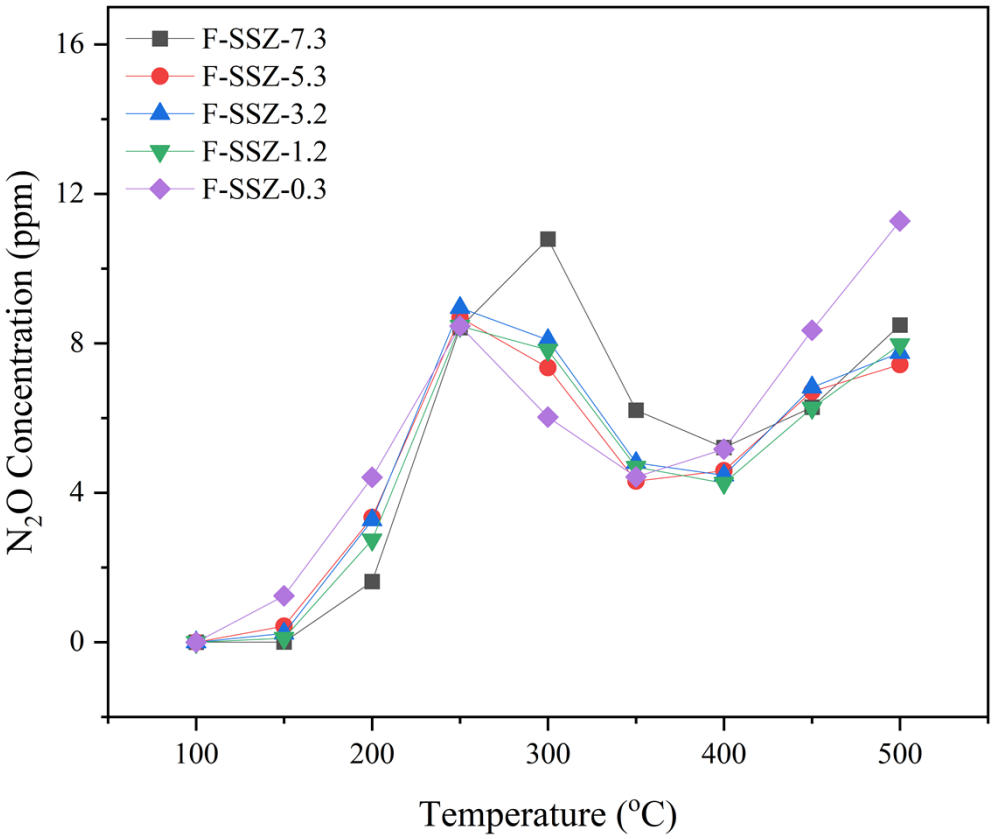

Figure S6. N_2O formation of fresh Cu/SSZ-13 catalysts during standard SCR reaction.

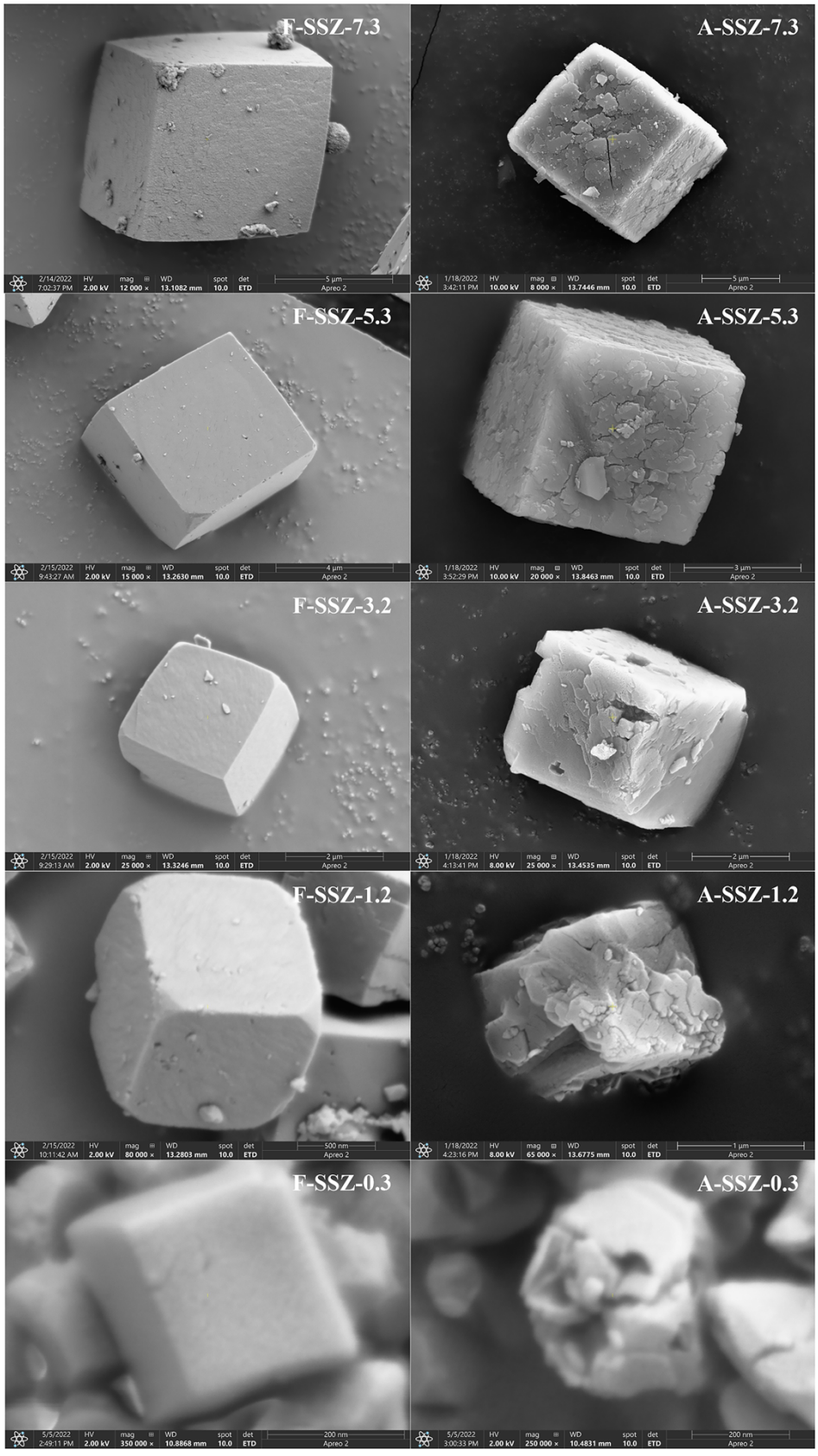

Figure S7. Morphology changes of Cu/SSZ-13 with different crystal size before and after high-temperature hydrothermal aging

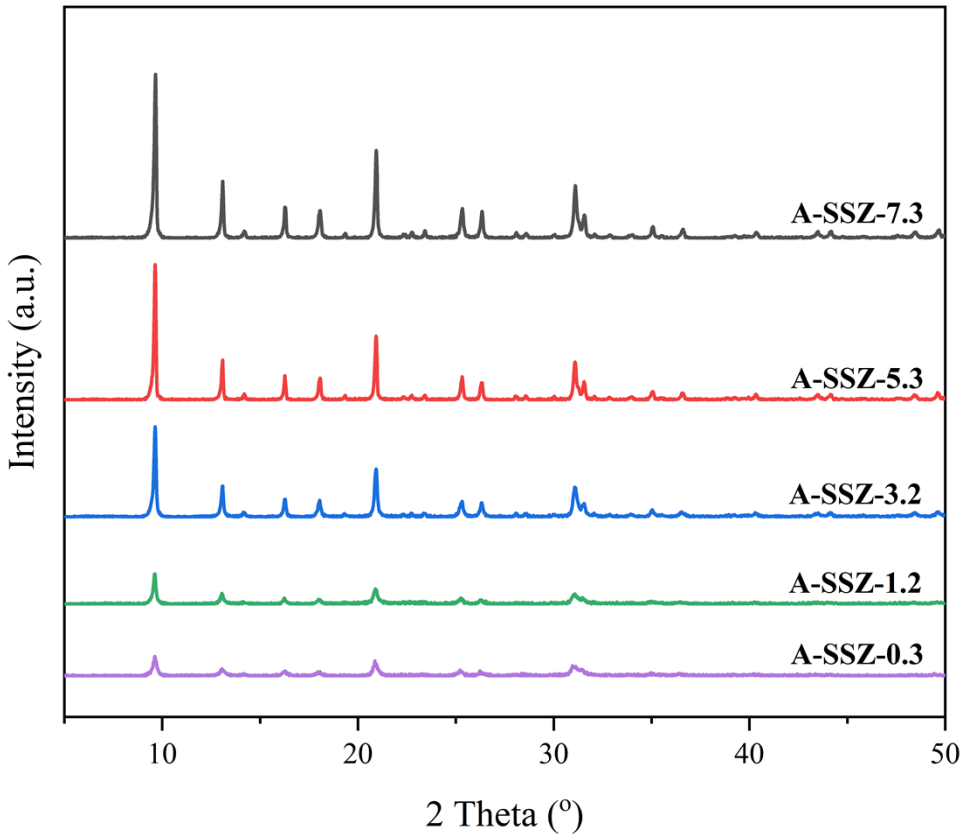

Figure S8. XRD patterns of aged catalysts in the range of 5-50°.

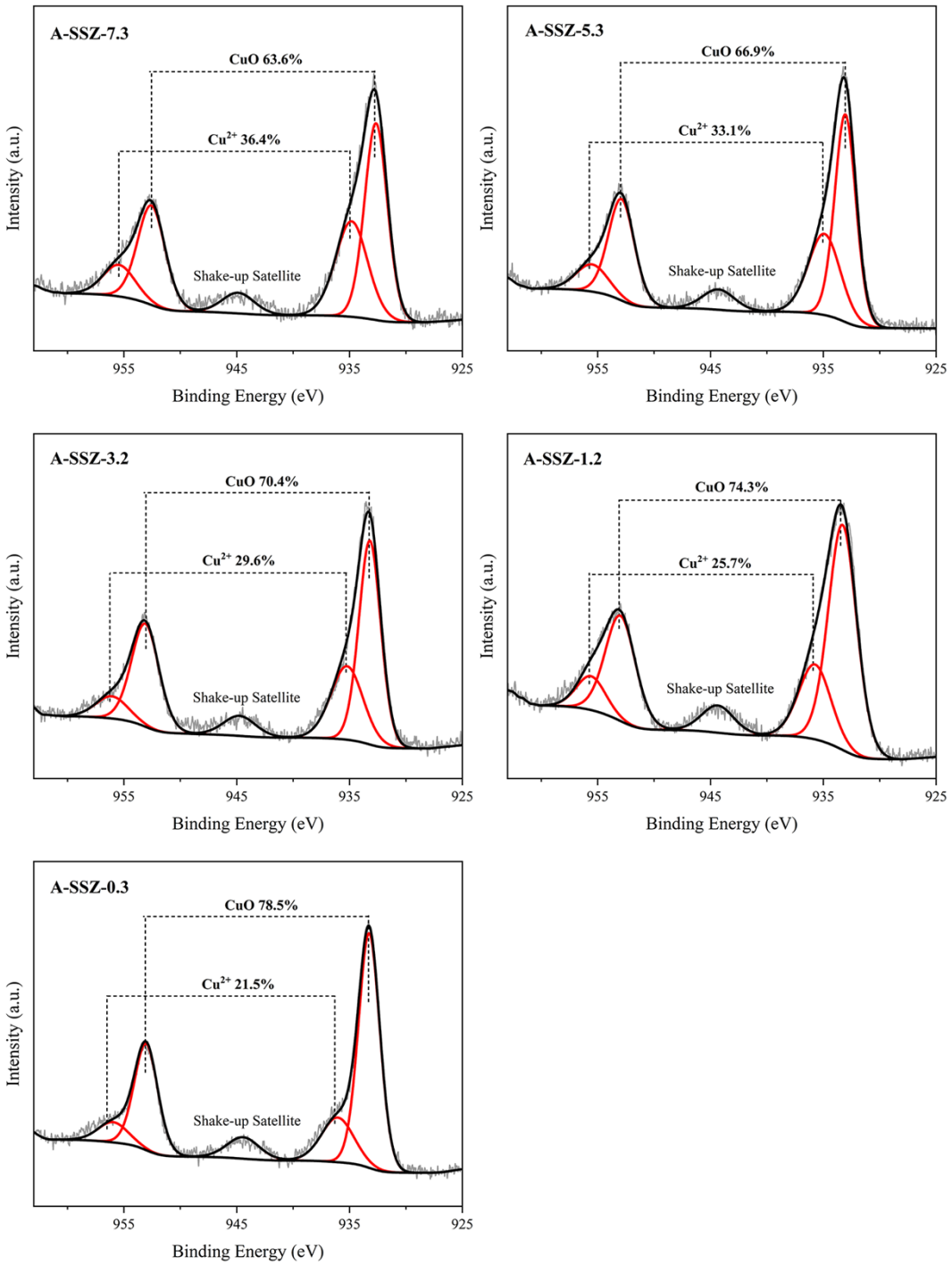

Figure S9. The deconvolution curves of Cu 2P XPS spectra for all aged Cu/SSZ-13 catalysts

Table S1. Texture properties of Cu/SSZ-13 catalysts

Sample	Micropore surface area (m^2/g)	t-Plot External Surface Area(m^2/g)	Pore volume (cm^3/g)	pore size（nm）	BET descending extent (%)
F-SSZ-7.3	891	5.1	0.33	0.383	/
F-SSZ-5.3	909	1.5	0.34	0.386	/
F-SSZ-3.2	841	10.1	0.32	0.387	/
F-SSZ-1.2	820	22.2	0.29	0.382	/
F-SSZ-0.3	780	61.9	0.29	0.388	/
A-SSZ-7.3	821	141.8	0.25	0.389	7.9
A-SSZ-5.3	757	173.8	0.22	0.387	16.7
A-SSZ-3.2	710	175.2	0.20	0.385	15.6
A-SSZ-1.2	482	150.9	0.17	0.389	41.9
A-SSZ-0.3	331	98.1	0.11	0.384	57.1

Table S2. NH_3 released at different temperature region of F-H/SSZ-13 samples

Samples	Total NH_3 storage ($mmol/g_{catal}$)	Low-temperature region（A） ＜240 °C ($mmol/g_{catal}$)	High-temperature region（B） ＞240 °C ($mmol/g_{catal}$)	A/B
F-H/SSZ-7.3	0.470	0.042	0.428	0.098
F-H/SSZ-3.2	0.491	0.075	0.416	0.180
F-H/SSZ-0.3	0.533	0.135	0.398	0.339

Table S3. Micropore surface area of H/SSZ-13 catalysts

Sample	Micropore surface area (m^2/g)	BET preservation extent (%)
F-H/SSZ-7.3	808	/
F-H/SSZ-3.2	806	/
F-H/SSZ-0.3	772	/
A-H/SSZ-7.3	786	97.3
A-H/SSZ-3.2	736	91.3
A-H/SSZ-0.3	601	77.8