Electronic Supplementary Material (ESI) for Catalysis Science & Technology.

Electronic Supplementary Information:

Cu-exchanged RTH-type zeolites for NH_3-selective catalytic reduction of NOx: Cu distribution and hydrothermal stability

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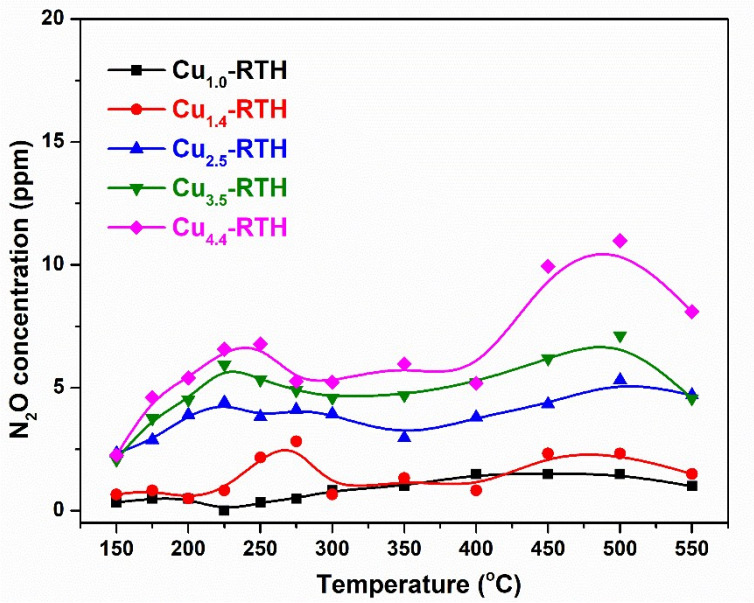

Fig. S1 N_2O production of Cu-RTH catalysts with different Cu loadings in the NH_3-SCR reaction. Conditions: 500 ppm NO, 500 ppm NH_3, 5% O_2, 5% H_2O and balanced with N_2. GHSV = 100,000 h^{-1}.

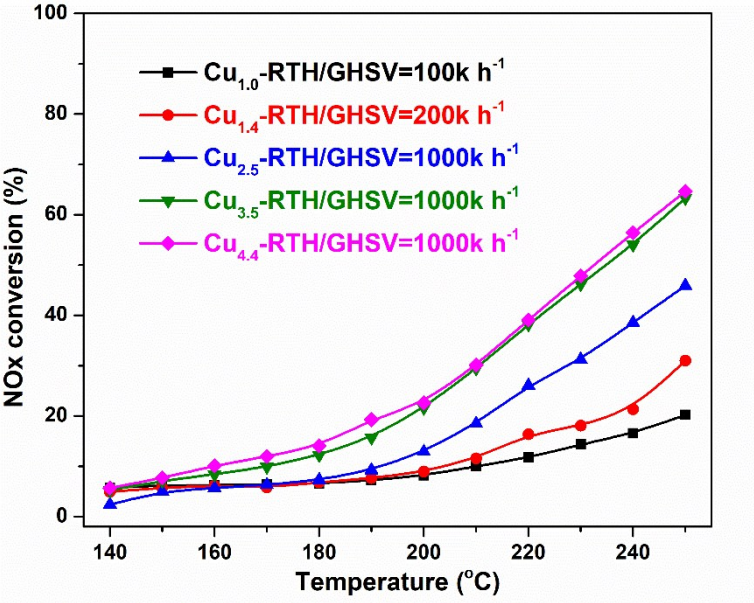

Fig. S2. NOx conversion of Cu-RTH catalysts with different Cu loadings in the NH_3-SCR reaction with varying GHSVs. conditions: 500 ppm of NO, 500 ppm of NH_3, 5% O_2, 5% H_2O and balanced with N_2.

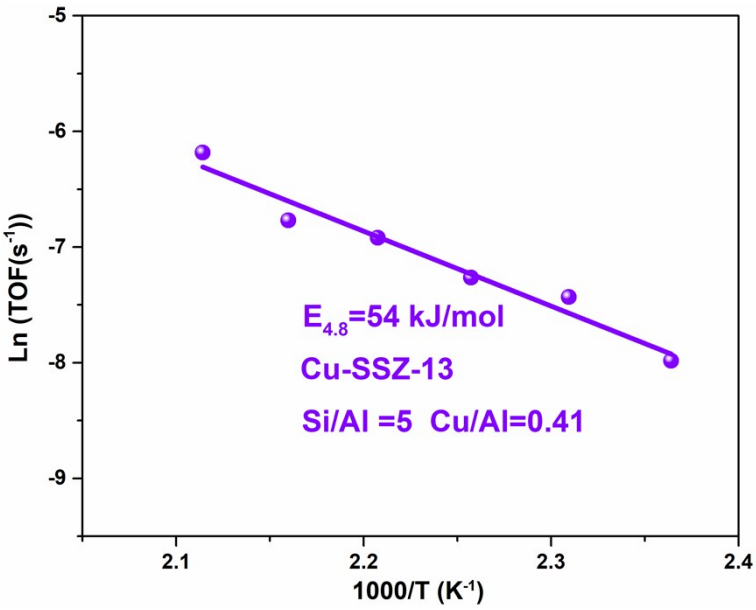

Fig. S3. Arrhenius plots of NOx conversion over Cu-SSZ-13 catalyst with Cu loadings of 4.8 wt.%.

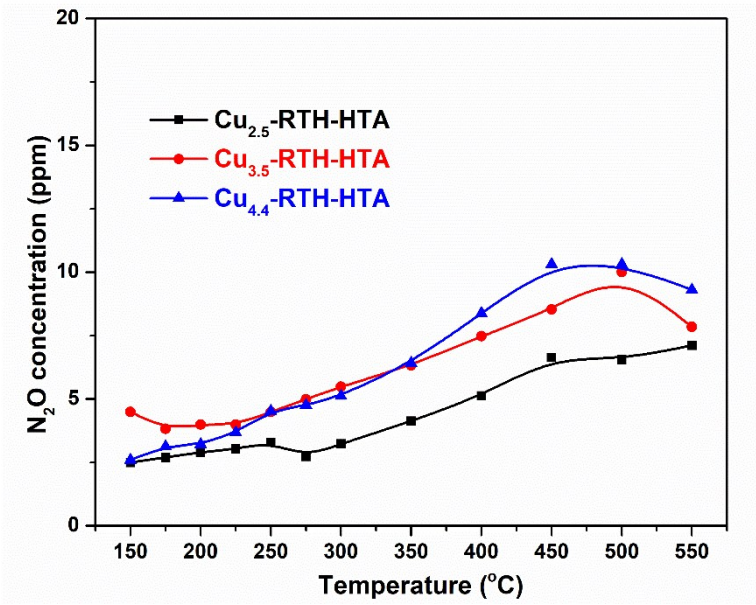

Fig. S4. N_2O production of hydrothermally aged Cu-RTH catalysts with different Cu loadings in the NH_3-SCR reaction. Conditions: 500 ppm of NO, 500 ppm of NH_3, 5% O_2, 5% H_2O and balanced with N_2. GHSV = 100,000 h^{-1}.

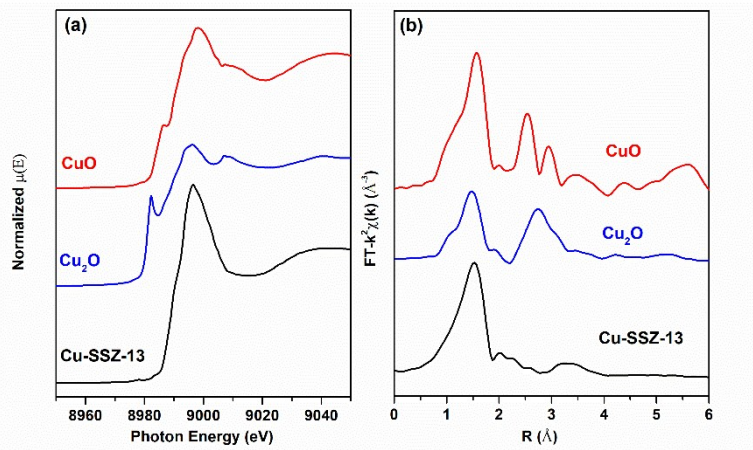

Fig. S5. Cu K-edge XANES spectra (a) and associated Fourier transform of the EXAFS spectra (b) of referenced materials.

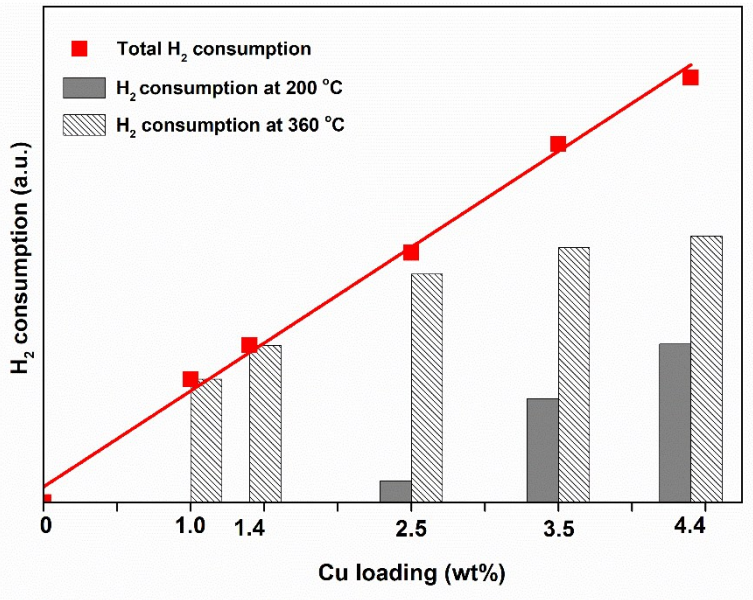

Fig. S6. H_2 consumption intensity in H_2-TPR profiles as a function of Cu loading.

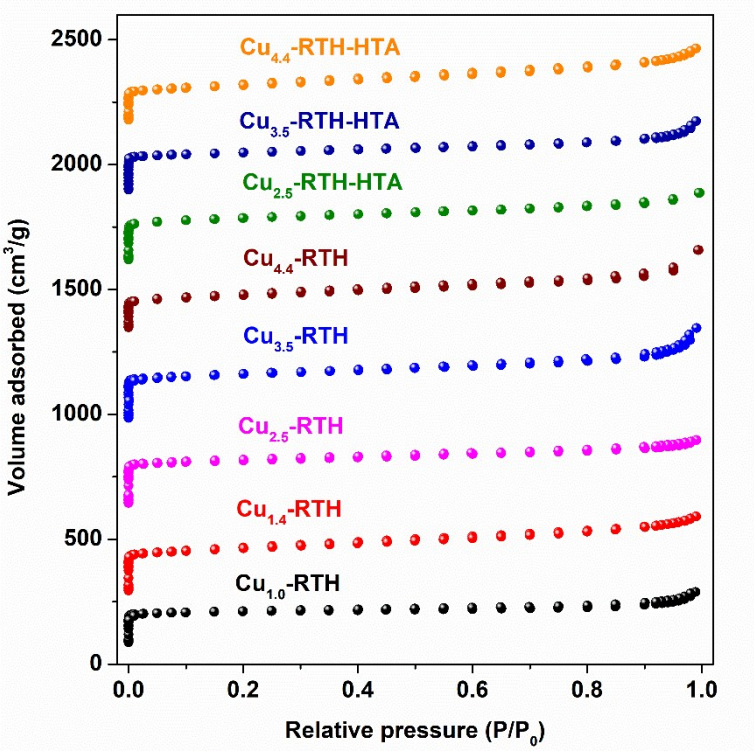

Fig. S7. N_2 adsorption-desorption isotherms of Cu-RTH and Cu-RTH-HTA with different Cu loadings.

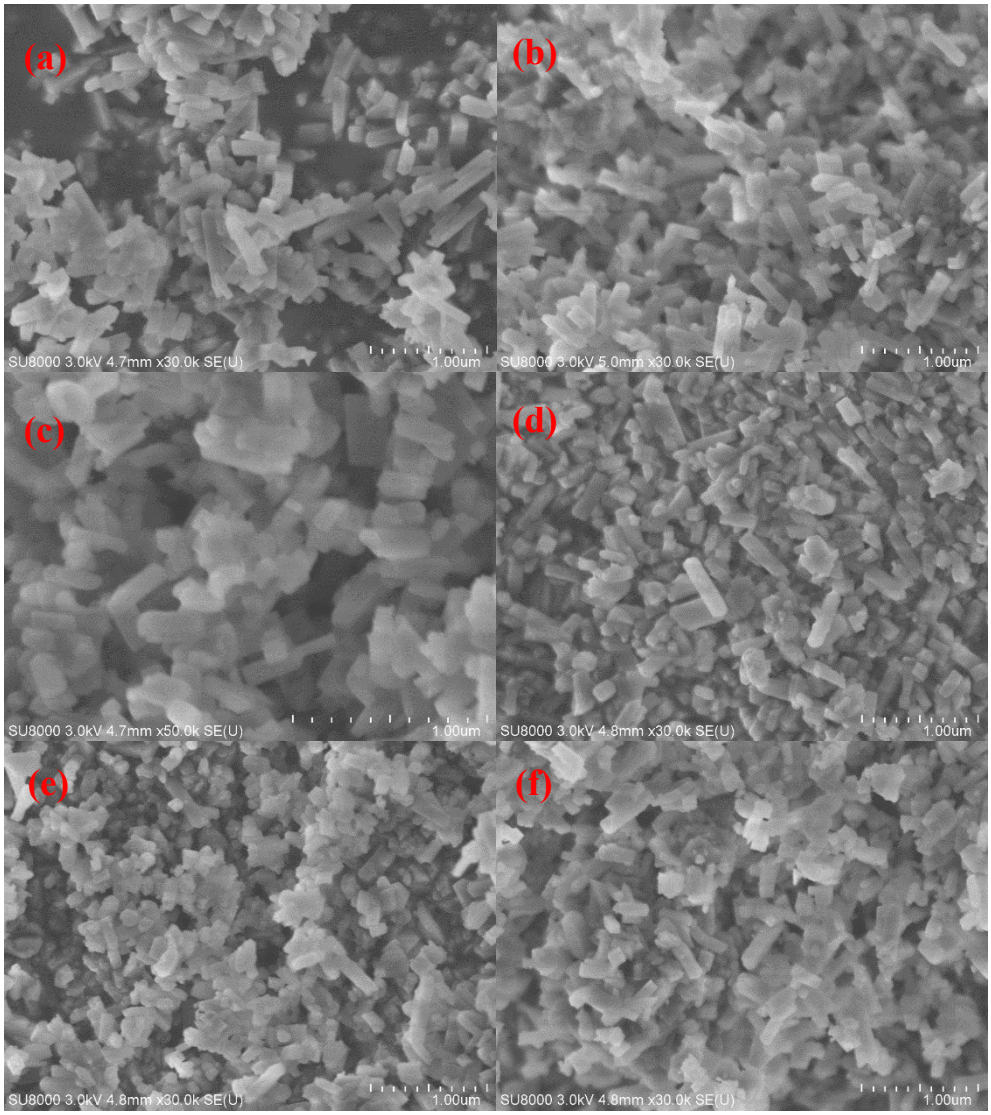

Fig. S8. SEM images of the fresh and hydrothermally aged Cu-RTH catalysts with different Cu loadings: (a) $Cu_{2.5}$-RTH, (b) $Cu_{2.5}$-RTH-HTA, (c) $Cu_{3.5}$-RTH, (d) $Cu_{3.5}$-RTH-HTA, (e) $Cu_{4.4}$-RTH, (f) $Cu_{4.4}$-RTH-HTA

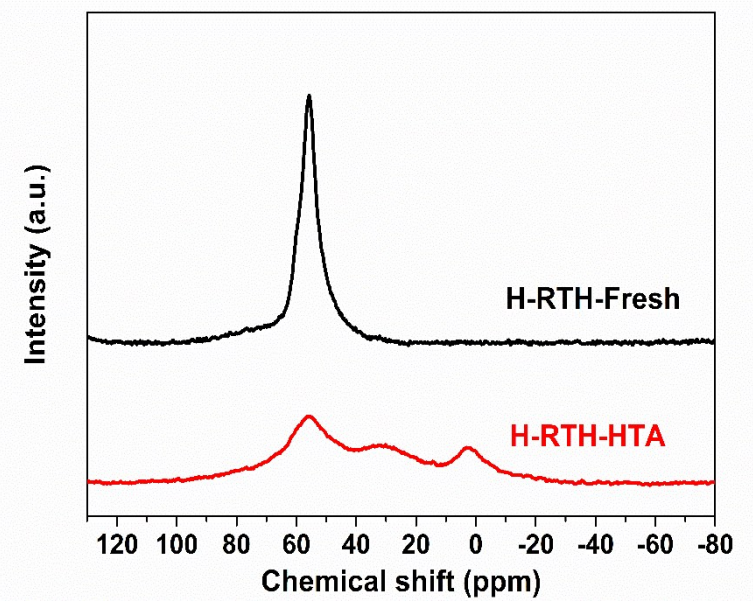

Fig. S9. ^{27}Al-NMR profiles of fresh and hydrothermally aged H-RTH zeolites.

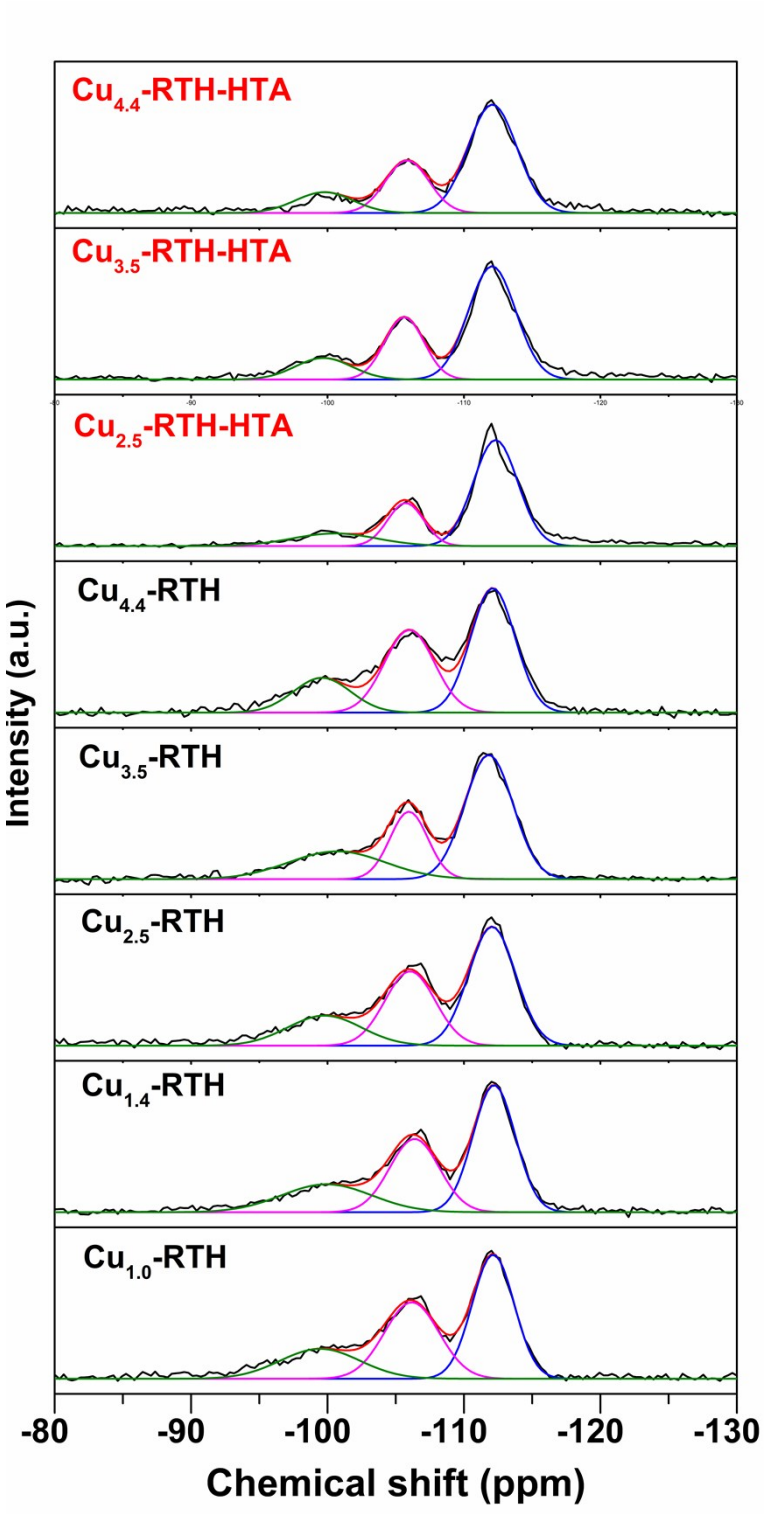

Fig. S10. Deconvolution of ^{29}Si-NMR profiles over fresh and hydrothermally aged Cu-RTH catalysts with different Cu loadings.

Table S1 EAXFS fitting parameters for Cu-RTH and Cu-SSZ-13 catalysts.

Sample	Pair	CN	R (Å)	ΔE	σ^2 (Å^2)	R factor
$Cu_{1.0}$-RTH	Cu-O	3.6 ± 0.1	1.95 ± 0.01	-3.7 ± 0.5	0.0049 ± 0.0004	0.0009
$Cu_{1.4}$-RTH	Cu-O	3.5 ± 0.2	1.95 ± 0.01	-3.7 ± 0.7	0.0047 ± 0.0007	0.0033
$Cu_{2.5}$-RTH	Cu-O	3.5 ± 0.2	1.95 ± 0.01	-3.6 ± 0.7	0.0049 ± 0.0006	0.0024
$Cu_{3.5}$-RTH	Cu-O	3.6 ± 0.1	1.95 ± 0.01	-3.7 ± 0.4	0.0049 ± 0.0004	0.0011
$Cu_{4.4}$-RTH	Cu-O	3.7 ± 0.1	1.95 ± 0.01	-3.2 ± 0.5	0.0050 ± 0.0005	0.0043
$Cu_{2.5}$-RTH-HTA	Cu-O	3.8± 0.3	1.96 ± 0.01	-6.3 ± 1.0	0.0052 ± 0.0009	0.0053
$Cu_{3.5}$-RTH-HTA	Cu-O	3.8± 0.3	1.94 ± 0.01	-6.1 ± 1.0	0.0054 ± 0.0009	0.0051
$Cu_{4.4}$-RTH-HTA	Cu-O	3.5± 0.2	1.96 ± 0.01	-2.3 ± 0.7	0.0055 ± 0.0007	0.0067

CN: coordination number; R: distance over first shell; ΔE: edge position σ: Debye-Waller factor.