Electronic Supporting Information

for

"Iron-exchanged high-silica LTA zeolite as hydrothermally stable NH_3-SCR catalysts"

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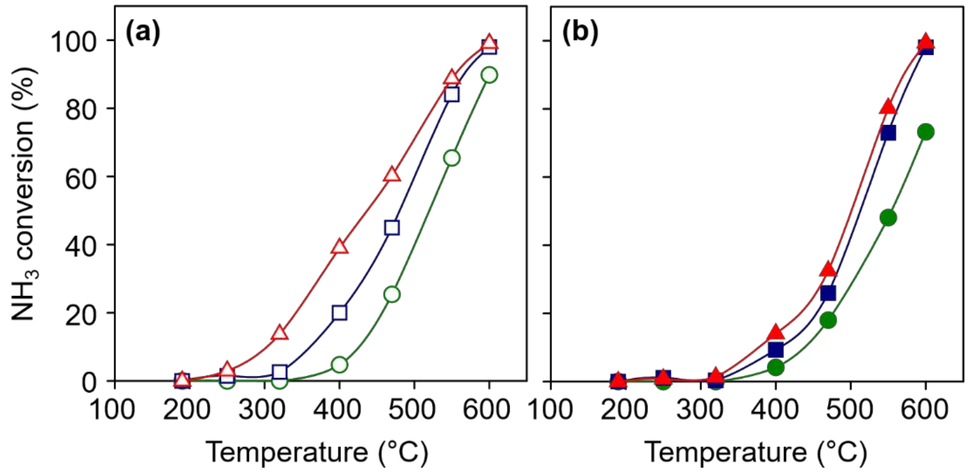

Fig. S1 NH_3 conversion as a function of temperature in the NH_3 oxidation reaction over the fresh (a) Fe-SSZ-13 and (b) Fe-LTA catalysts with the same Si/Al ratio but different Fe/Al ratios: Fe-SSZ-13-16-0.19, ○; Fe-SSZ-13-16-0.26, □; Fe-SSZ-13-16-0.35, △; Fe-LTA-16-0.18, ●; Fe-LTA-16-0.29, ■; Fe-LTA-16-0.37, ▲. The feed contains 500 ppm NH_3, 5% O_2 and 10% H_2O, balanced with N_2, at 100,000 h^{-1} GHSV. The last two numbers in the catalyst identification indicate the Si/Al and Fe/Al ratios of each catalysts, respectively.

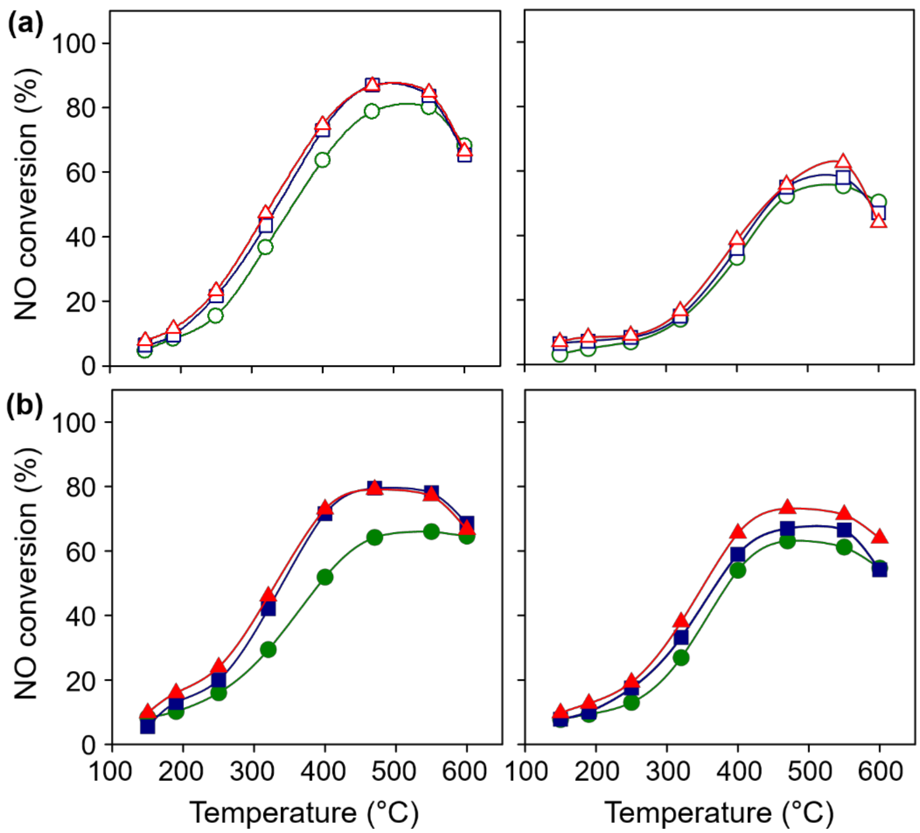

Fig. S2 NO conversion as a function of temperature in the NH_3-SCR reaction over the (left) 750 °C- and (right) 850 °C-aged forms of (a) Fe-SSZ-13 and (b) Fe-LTA catalysts with the same Si/Al ratio but different Fe/Al ratios: Fe-SSZ-13-16-0.19, ○; Fe-SSZ-13-16-0.26, □; Fe-SSZ-13-16-0.35, △; Fe-LTA-16-0.18, ●; Fe-LTA-16-0.29, ■; Fe-LTA-16-0.37, ▲. The feed contains 500 ppm NH_3, 500 ppm NO, 5% O_2 and 10% H_2O, balanced with N_2, at 100,000 h^{-1} GHSV. Hydrothermal aging was performed under flowing air containing 10% H_2O at 750 and 850 ºC for 24 h, respectively.

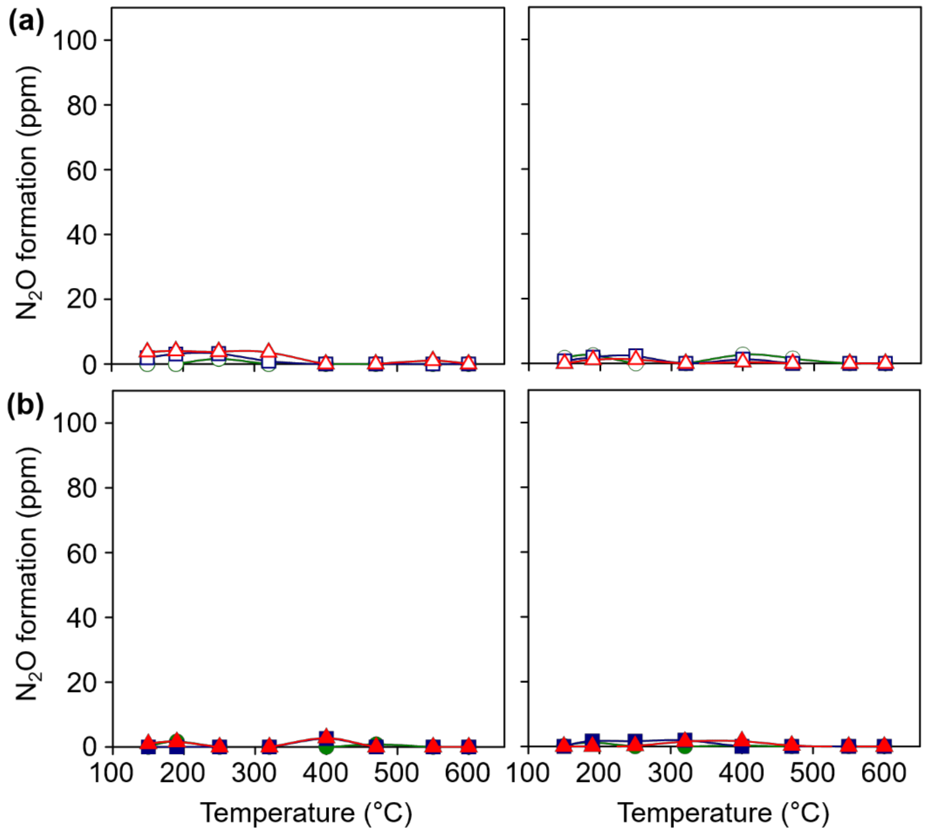

Fig. S3 N_2O formation as a function of temperature in the NH_3-SCR reaction over the (left) fresh and (right) 900 °C-aged forms of (a) Fe-SSZ-13 and (b) Fe-LTA catalysts with the same Si/Al ratio but different Fe/Al ratios: Fe-SSZ-13-16-0.19, ○; Fe-SSZ-13-16-0.26, □; Fe-SSZ-13-16-0.35, △; Fe-LTA-16-0.18, ●; Fe-LTA-16-0.29, ■; Fe-LTA-16-0.37, ▲. Hydrothermal aging was performed under flowing air containing 10% H_2O at 900 ºC for 12 h. The feed composition is the same as that given in Fig. S2.

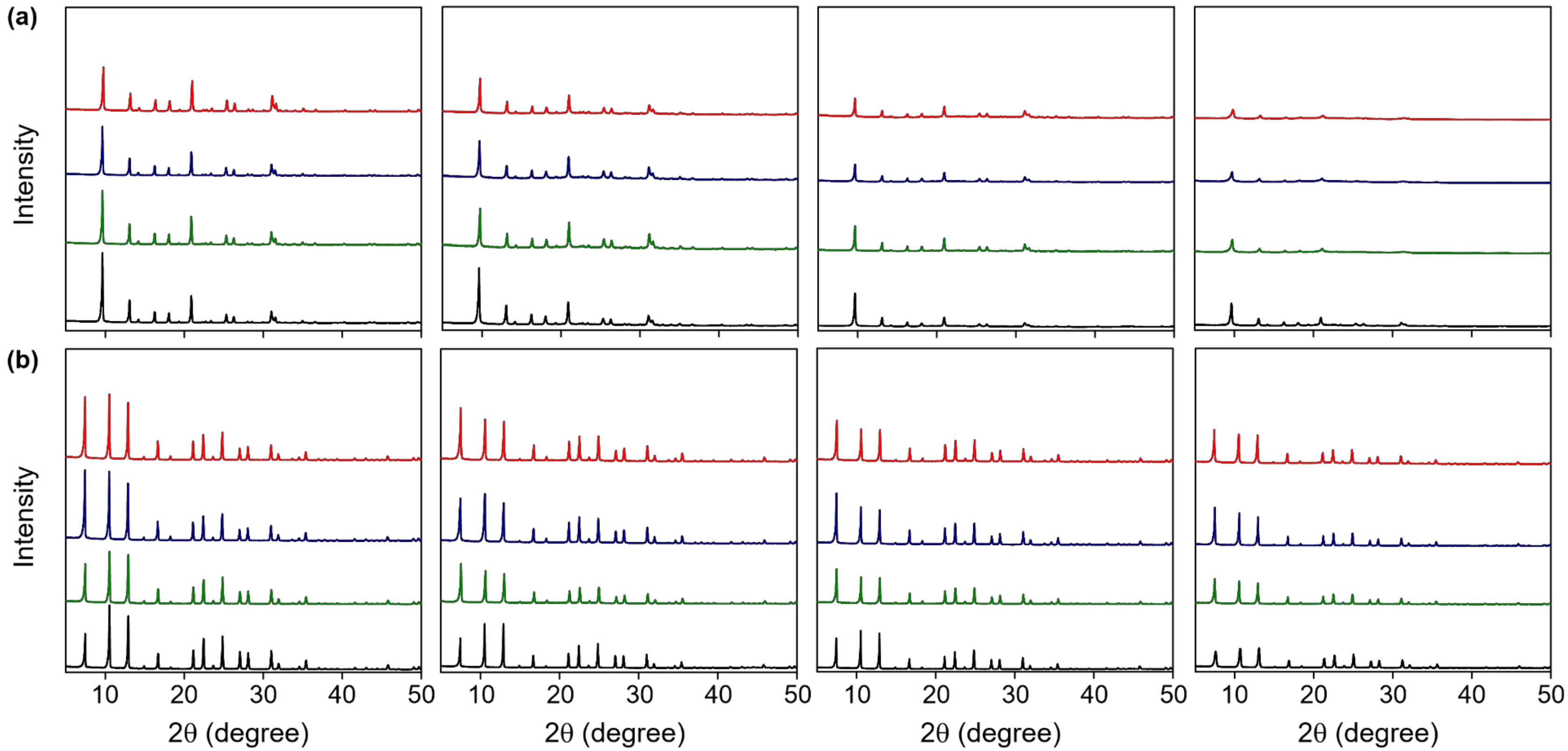

Fig. S4 Powder X-ray patterns of the (from left to right) fresh, 750 °C-, 850 °C-, and 900 °C-aged forms of (a, from bottom to top) Fe-SSZ-13-16-0 (black), Fe-SSZ-13-16-0.19 (green), Fe-SSZ-13-16-0.26 (navy), and Fe-SSZ-13-16-0.35 (red) and (b, from bottom to top) Fe-LTA-16-0 (black), Fe-LTA-16-0.18 (green), Fe-LTA-16-0.29 (navy), and Fe-LTA-16-0.37 (red) catalysts. Hydrothermal aging was conducted under flowing air containing 10% H_2O at 750 and 850 ºC for 24 h and at 900 ºC for 12 h, respectively.

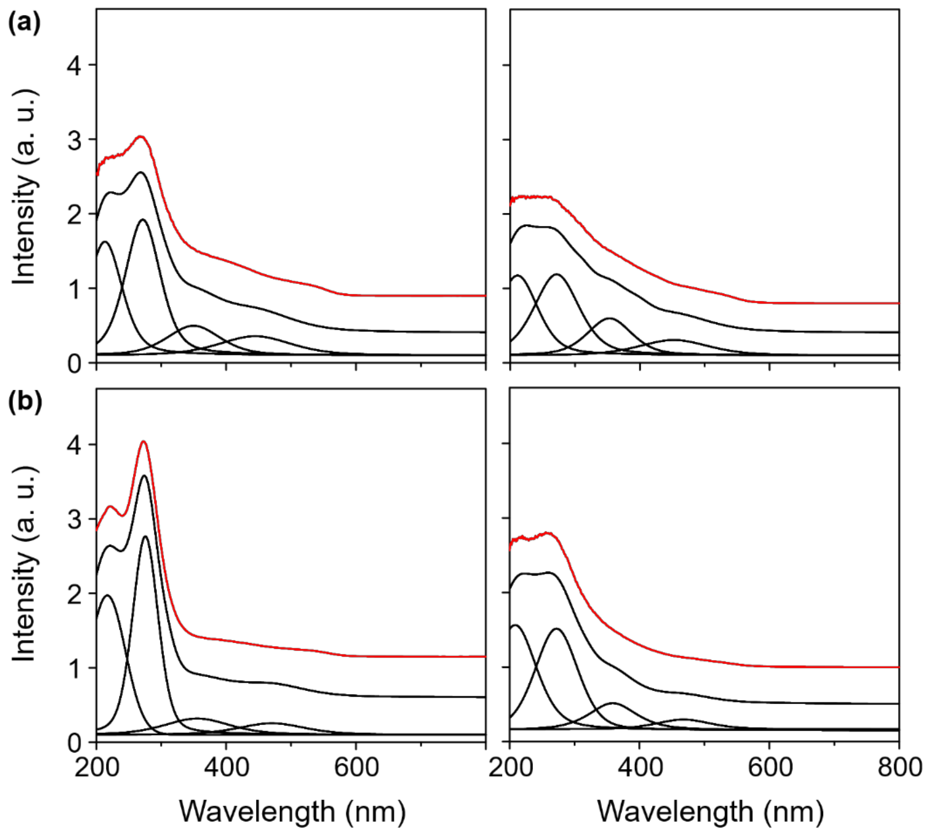

Fig. S5 UV-vis spectra of the (left) fresh and (right) 900 °C-aged forms of (a) Fe-SSZ-13-16-0.35 and (b) Fe-LTA-16-0.37 catalysts: experimental (top); simulated (middle); deconvoluted components (bottom). The hydrothermal aging conditions are the same as that given in Fig. S3.

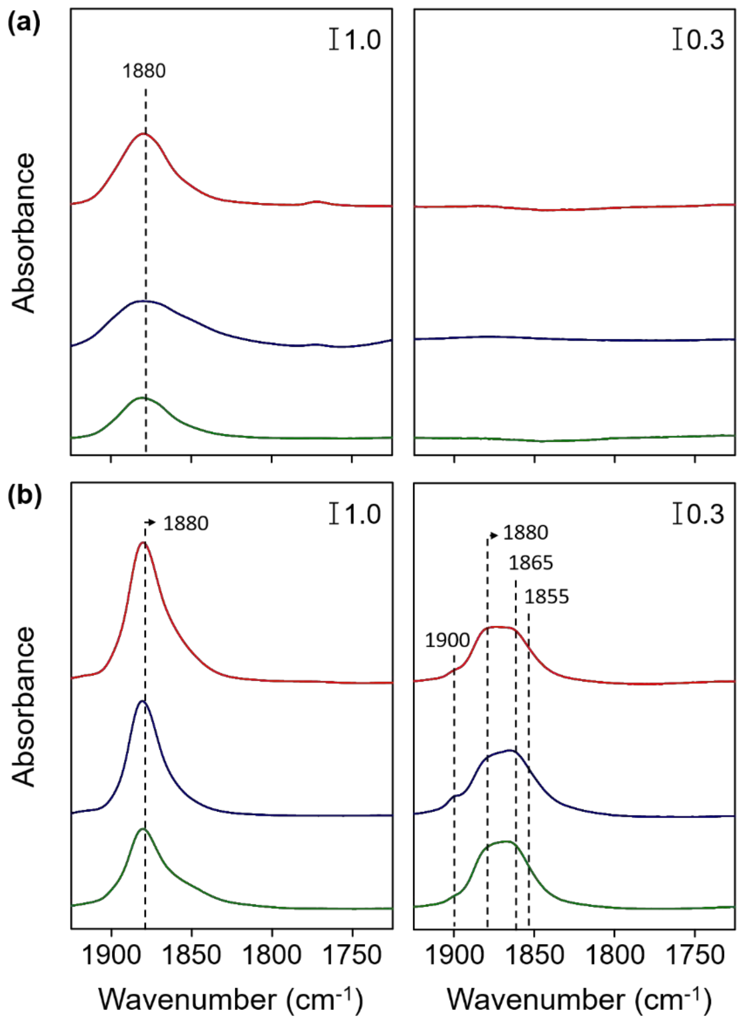

Fig. S6 Difference IR spectra of adsorbed NO on the (left) fresh and (right) 900 °C-aged forms of (a, from bottom to top) Fe-SSZ-13-16-0.19 (green), Fe-SSZ-13-16-0.26 (navy), and Fe-SSZ-13-16-0.35 (red) and (b, from bottom to top) Fe-LTA-16-0.18 (green), Fe-LTA-16-0.29 (navy), and Fe-LTA-16-0.37 (red) catalysts. All the spectra were collected at room temperature after evacuation under vacuum to a residual pressure of 10^{-4} Pa at the same temperature for 1 h.