

Infrared spectra of two USY zeolites with SAR values of 33 and 85

Figs. S1 shows the IR spectra of the CO and hydroxyl regions of VUSY(33). The evolution of these spectra is qualitatively similar to those of USY(8.1). The most striking differences are the presence of more silanol groups with increasing silica-to-alumina (SAR) ratio and the lower intensity of the band at 2171 cm^{-1} . The latter band is nearly absent in the spectra of XVUSY(85) (not shown). Deeper ultra-stabilization has resulted in more defects and, hence, in more silanol groups. The siliceous zeolite contains only a very small amount of an extraframework silica-alumina phase as a result of acid leaching steps. This is evident from the absence of the band at 2171 cm^{-1} . The frequency shift $\Delta\nu_{\text{OH}}$ for (HF) OH of around 360 cm^{-1} for these two zeolites corresponds to the value for USY(8.1). A similar experiment for HY(5) gave a CO stretch at 2178 cm^{-1} and a value of 297 cm^{-1} for $\Delta\nu_{\text{OH}}$. The shift of the CO band and the significantly lower shift of the OH stretch upon complexation by CO signify the somewhat lower acidity of the bridging hydroxyl groups of non-dealuminated Y zeolite. Besides these bands, the interaction of CO with LAS is observed for VUSY(33) and XVUSY(85). For VUSY(33), bands around 2190 and 2228 cm^{-1} develop. The latter feature is absent in XVUSY(85).

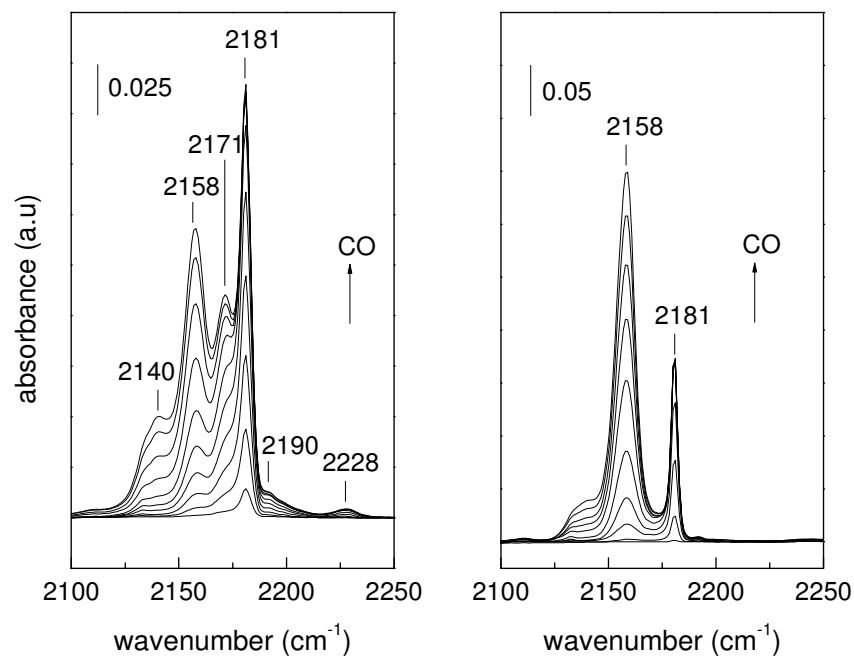


Figure S1: Carbonyl stretching (left) and hydroxyl (right) regions of the infrared spectra of well-dehydrated VUSY(33) at 80 K as a function of the CO coverage.

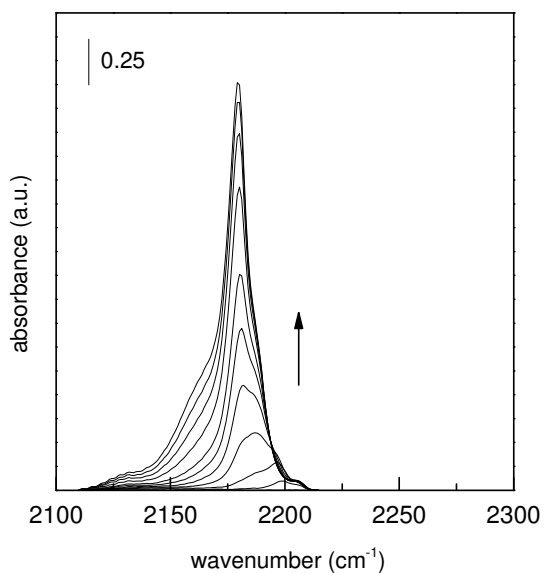


Figure S2: Carbonyl stretching region of the IR spectra of well-dehydrated MgSAP(33) at 80 K as a function of the CO coverage. Bands due to

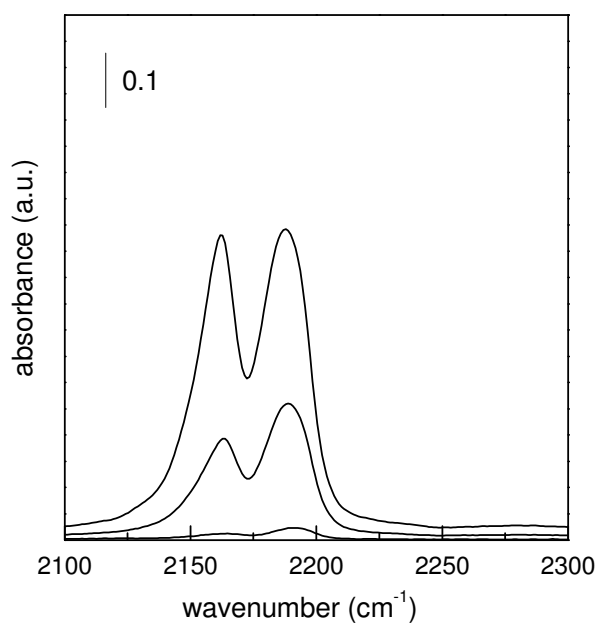


Figure S3: Carbonyl stretching region of $\gamma\text{-Al}_2\text{O}_3$ at 80 K at relatively high CO coverage, showing two bands at 2160 cm^{-1} and 2192 cm^{-1} representative of aluminol groups and weak Lewis acid sites.

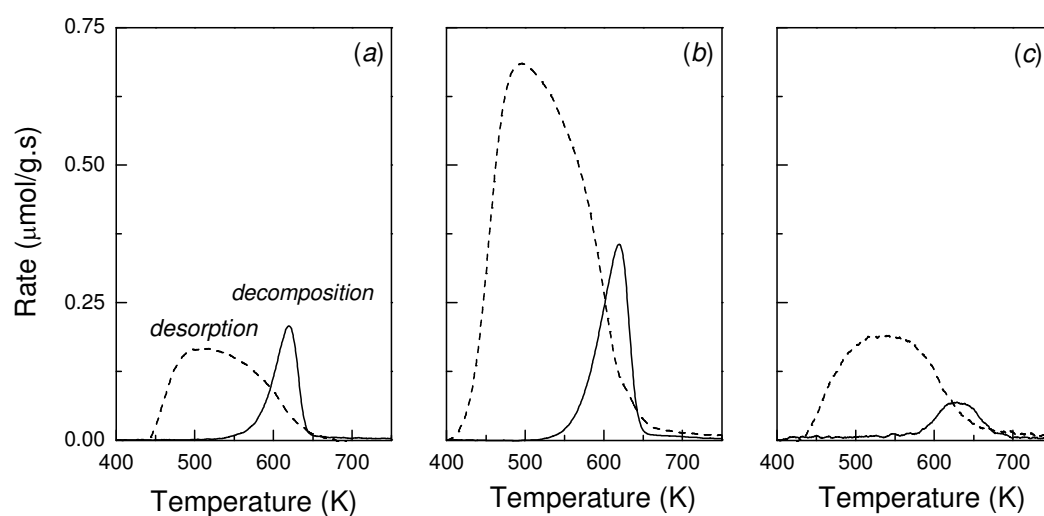


Figure S4: Rate of IPAm desorption (dashed line) and decomposition (full line) of USY(8.1, I) (a), VUSY(33) (b) and XVUSY(85) (c) as a function of temperature.

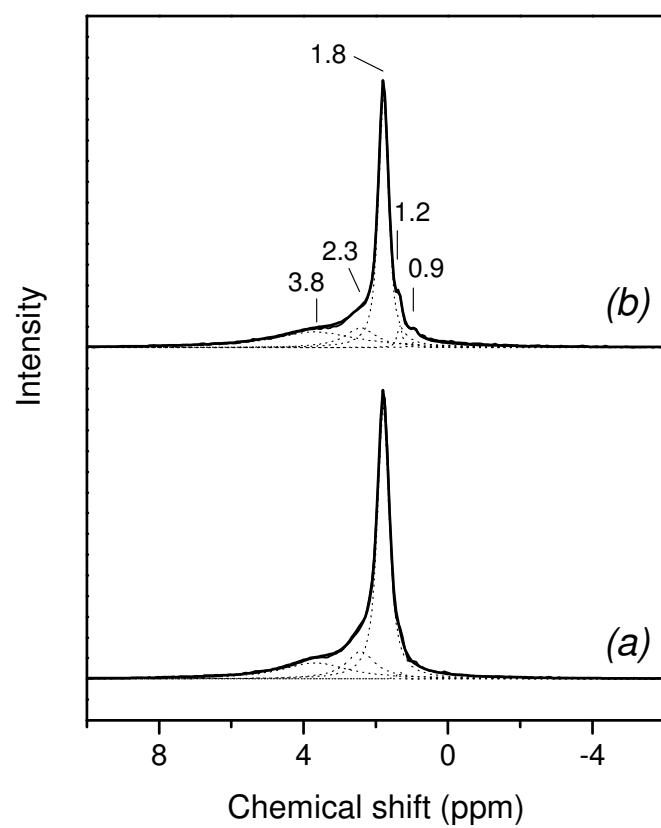


Figure S4: ^1H MAS NMR spectra of (a) ASA(5/95,1073) and (b) ASA(20/80,1073).

Table S1: pH values observed during adsorption of Cs^+ for set of amorphous silica-aluminas. The subscript in the pH indication refers to the contact time of the support (min) with the CsCl solutions.

Cs content	ASA (5/95, 1073)			ASA (10/90, 1073)			ASA (15/85, 1073)			ASA (20/80, 1073)		
mg/ml	pH ₀	pH ₅	pH ₆₀	pH ₀	pH ₅	pH ₆₀	pH ₀	pH ₅	pH ₆₀	pH ₀	pH ₅	pH ₆₀
1.6	4.4	2.8	2.7	4.0	2.7	2.7	5.5	4.4	4.6	5.5	4.4	4.7
1.2	4.0	2.7	2.7	4.1	2.7	2.7	5.6	4.2	4.5	5.4	4.2	4.7
0.8	4.0	2.5	2.4	4.0	2.7	2.6	5.8	4.4	4.4	5.7	4.3	4.7
0.4	4.5	2.8	2.7	3.8	2.6	2.5	5.8	4.4	4.4	6.0	4.7	4.6