



**Figure S1.** The ground-state absorption spectrum of pyrene in zeolites. The spectra were collected in the diffuse transmittance mode by the use of a CCD array spectrometer and a steady-state xenon arc lamp. Background spectra were collected on blank disks that were either dehydrated or hydrated at the level designated for each sample. The offset in the sample *versus* blank spectra is due to minor differences in sample thickness (or pathlength) between the blank and the sample disk. In the hydrated samples, fluorescence can be observed as downward peaks in the region 370-400 nm, due to the fact that the partial pressure of O<sub>2</sub> could not be raised to a high enough level to efficiently quench all the fluorescence. The numbers represent the peak positions to the nearest nm.