

Supplementary Information:

Ultrafast hybridization screening in Fe^{3+} aqueous solution

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Speciation

Figure SII compares the flux-normalized RPE spectra from 0.5 and 1.5m FeCl_3 aqueous solution at $\text{pH} < 0.1$. Photon energy was 711 eV, which corresponds to the Fe $2p_{3/2}$ X-ray absorption maximum. The overall (total) intensity of the 0.5m spectrum is approximately 2.1 smaller than for 1.5m; this factor is smaller than the ratio of concentrations (which is 3). Apparently, concentration factor (x3) must be adjusted by speciation changes ($\div n$), where n is the ratio of number of first-shell water molecules at 0.5 and 1.5m concentration. For the present case n is approximately 0.7 ($= 3.5/5$), corresponding to primarily $\text{Fe}(\text{H}_2\text{O})_5\text{Cl}$ species contained in the low-concentration solution, and a mixture of $\text{Fe}(\text{H}_2\text{O})_4\text{Cl}_2$ and $\text{Fe}(\text{H}_2\text{O})_3\text{Cl}_3$ at high concentration, respectively (compare Experimental of the manuscript).

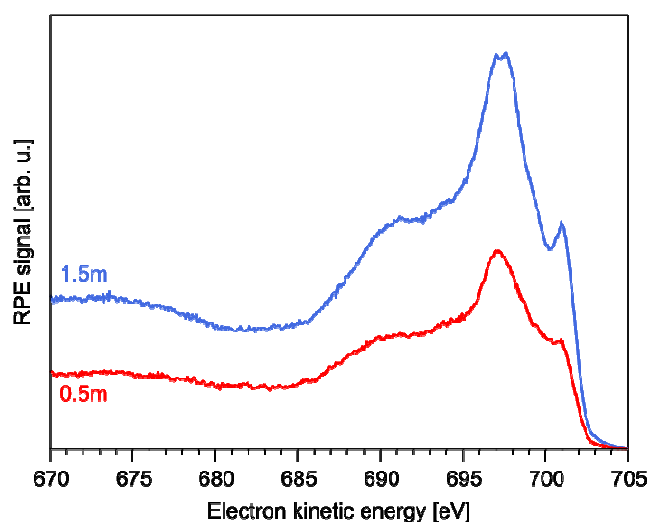


Figure SII