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Supporting information for

Determination of the Acidic Structure and Lewis Activity in Fe-based Ionic Liquid with Slope Analysis of Quantitative Pyridine-IR Spectrum

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Figure S1. Peak fitting curves of pyridine-IR. (a) Brönsted acid. Black line is Py-IR curve, red line is fitting curve, and blue line is baseline; (b) Lewis acid. Black line is fitting curve of pure pyridine, red line is fitting curve of Py-L complex, blue line Py-IR curve, and green line is baseline.



Figure S2. Incremental pyridine-IR spectrum. (a) Fe-IL^{non-aq}+pyridine; (b) Fe-IL^{aq}+pyridine; (c) Fe-IL^{non-aq}+HCl+pyridine.



Figure S3. Structure optimization of pyridine---HCl and pyridine---FeCl₄⁻ by DFT calculation.



Figure S4. FTIR spectrum of different Fe-IL system.



Figure S5. Structure optimization of NHD---HCl and NHD---HCl---pyridine by DFT calculation.