**Coordination of aluminum in saponite-like clay material as a function of synthesis pH**

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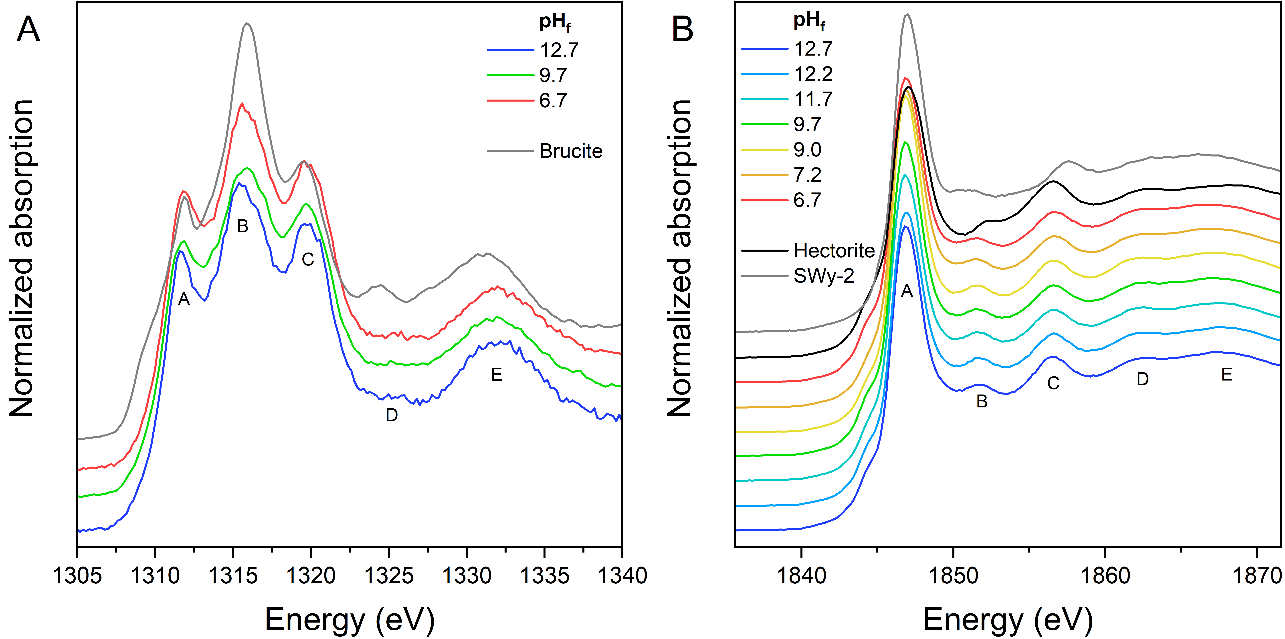
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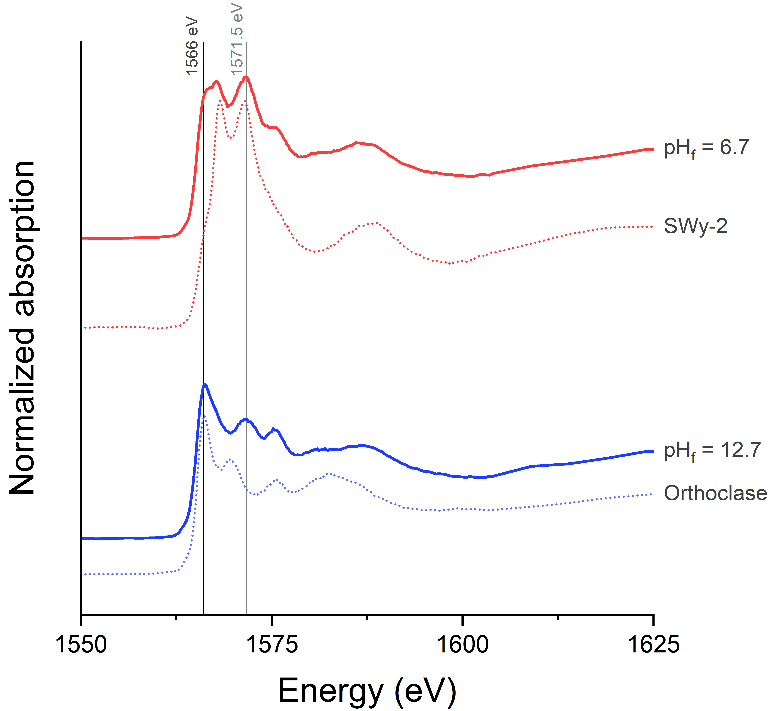
**SUPPORTING INFORMATION**



**Figure S1**. TEM image of synthetic saponite-like material with pHf = 9.7.

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**Figure S2**. XANES spectra of synthetic saponite-like materials, along with mineral references, recorded at the Mg K-edge (A) and Si K-edge (B). The curves have been translated along the y-axis for clarity.



**Figure S3.** XANES spectra at the Al K-edge of the two outermost samples (pHf = 6.7 and 12.7), along with mineral references of IVAl (orthoclase) and mixed IVAl and VIAl (smectite SWy-2). ****

**Figure S4.** Results of fitting the intermediate samples by linear combination using the spectral signatures of the two outermost samples (pHf = 6.7 and 12.7).