Supporting Information for:

Acidic Processing of Fly Ash: Chemical Characterization, Morphology, and Immersion Freezing

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Summary: This supporting information contains a table with the pH measurements of the suspended samples, a representative XRD diffractogram from 5° - 70°, and energy dispersive X-ray spectroscopy (EDS) images for the transmission electron microscopy (TEM) images in the manuscript.

Table S1. Measured pH measurements of the 0.3 wt. % fly ash samples.

	Fly Ash	Water-treated	Acid-treated
Class C	Joppa	8.59	7.57
	Welsh	8.94	7.65
Class C/F	Clifty	7.83	6.21
Class F	Miami	7.82	6.59

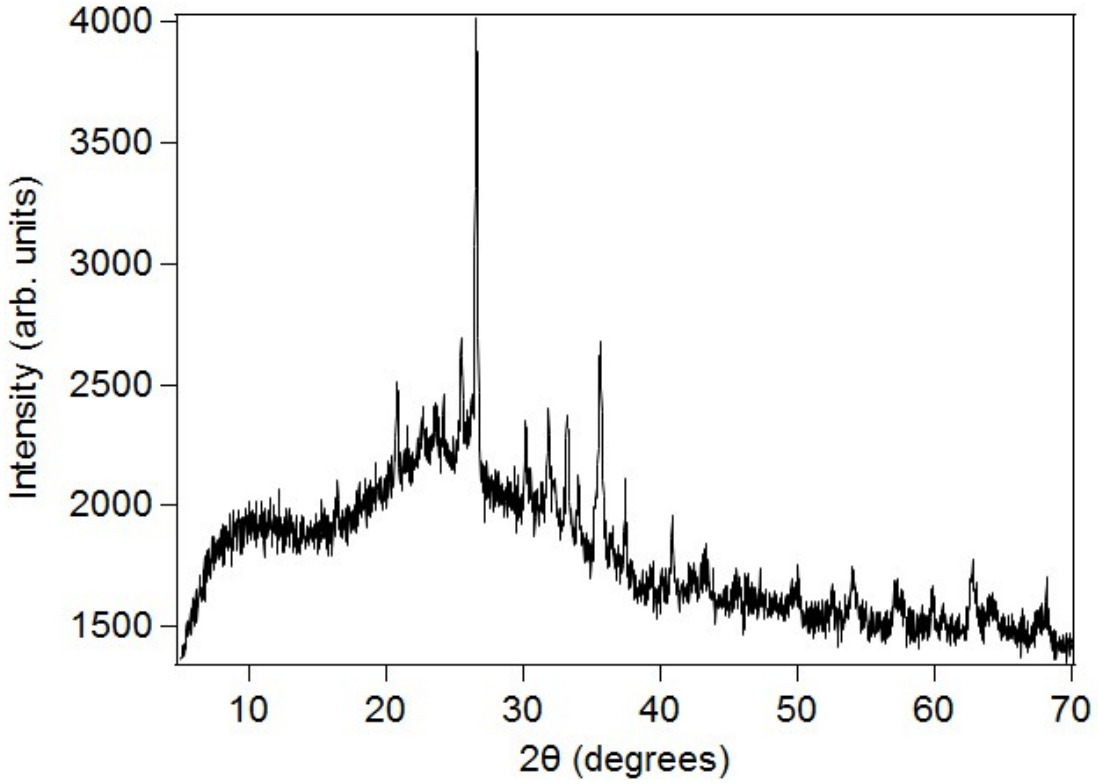

Figure S1. A representative XRD diffractogram taken from 5° - 70°. The XRD is an untreated Clifty sample and shows the higher angles (above 45°) that were not included in Fig. 1. At these higher angles, the intensity decreases making it difficult to differentiate between the components when labelling. The large bumps at 10° and 25° are likely due to amorphous components of the fly ash samples.

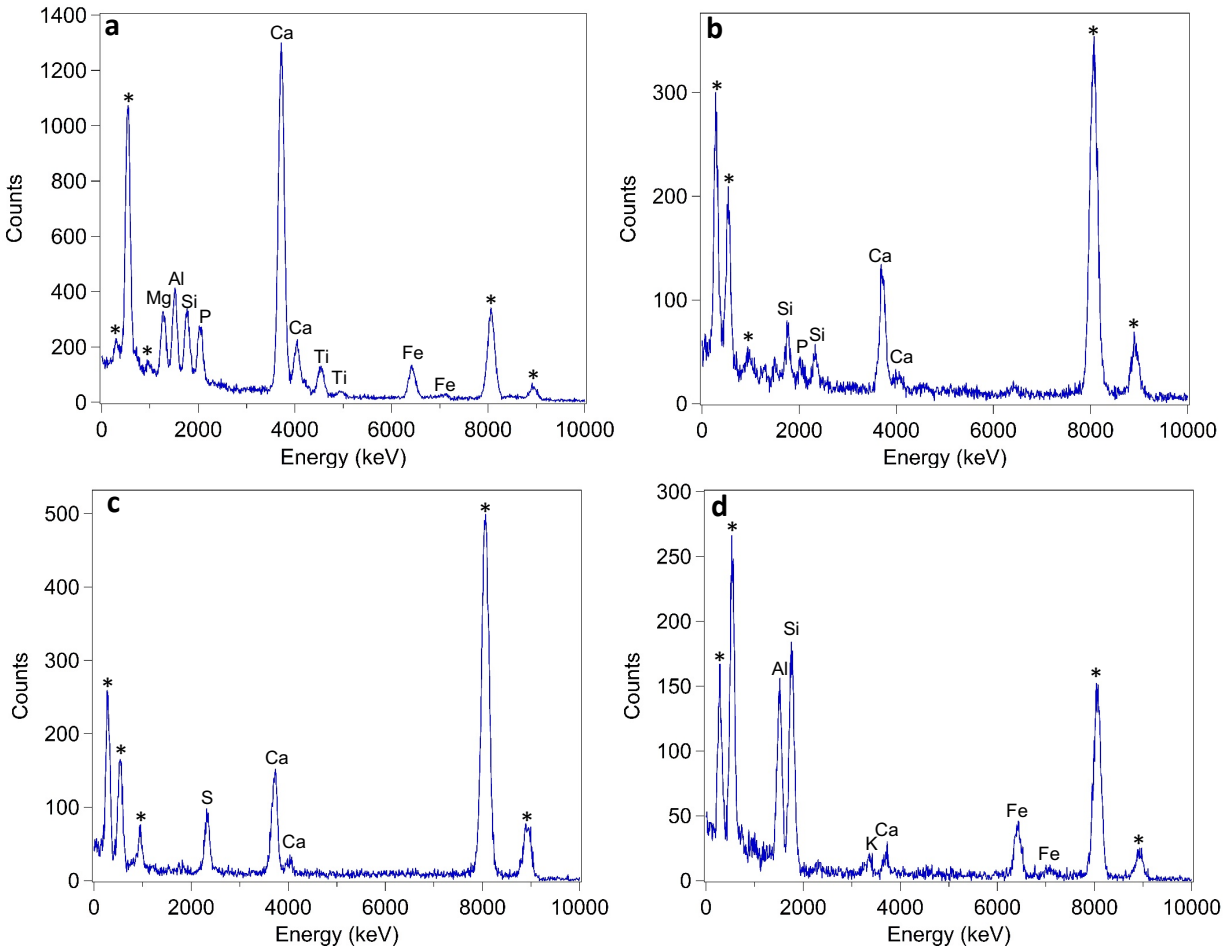

Figure S2. EDS spectra of the particles shown in Figure 2 of a) spherical, untreated Class C, b) irregular, untreated Class C, c) acid-treated Class C, and d) acid-treated Class C/F. The labels from Figure 2 correspond to the same letter in this figure. The elements are labeled by symbol in each spectrum. EDS peaks from background signals of C, O, and Cu are denoted by *.

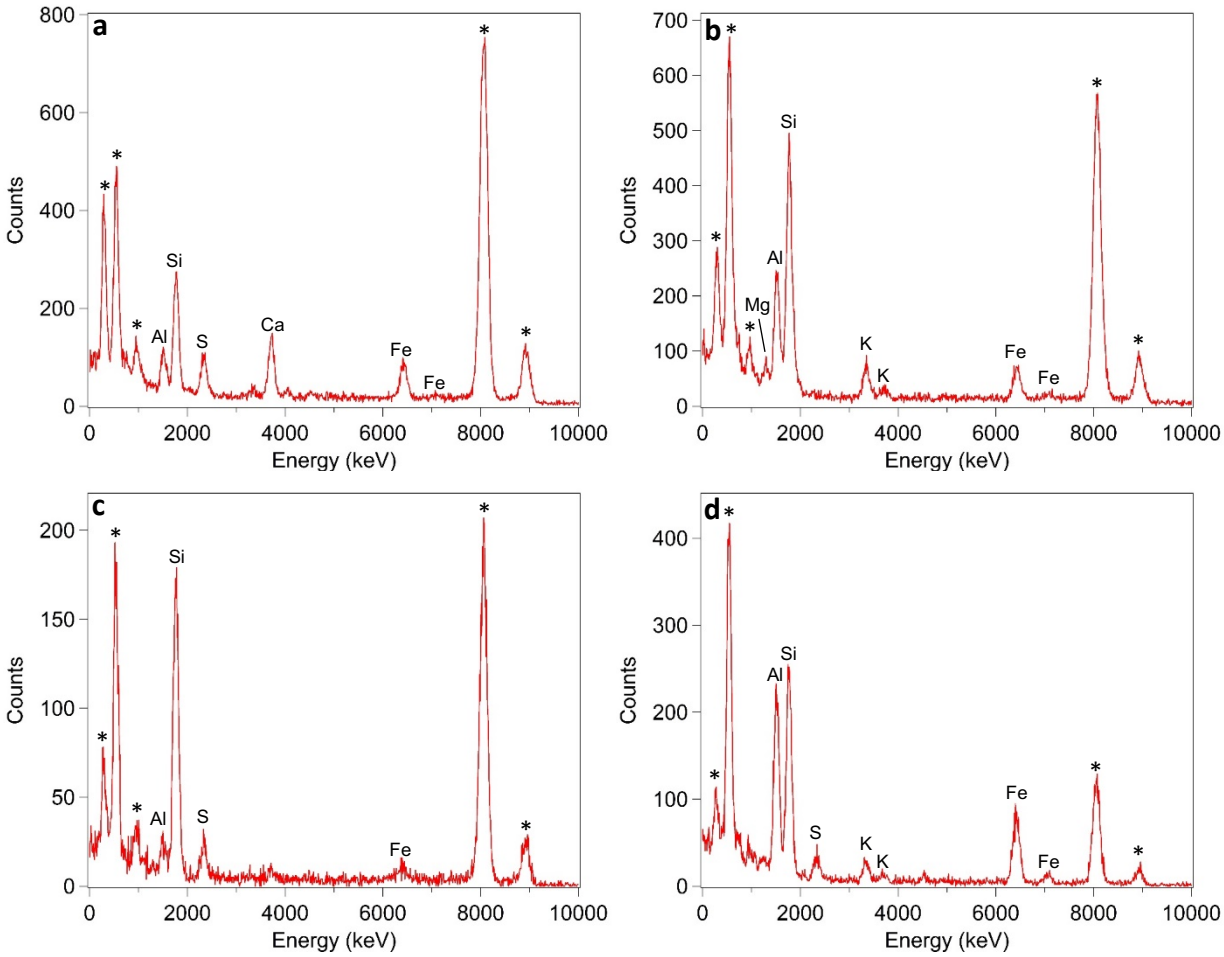

Figure S3. EDS spectra of the particles shown in Figure 3 of untreated Class F (a and b) and acid-treated Class F (c and d). The labels from Figure 3 correspond to the same letter in this figure. The elements are labeled by symbol in each spectrum. EDS peaks from background signals of C, O, and Cu are denoted by *.