

Supplementary Figures

Figure S1

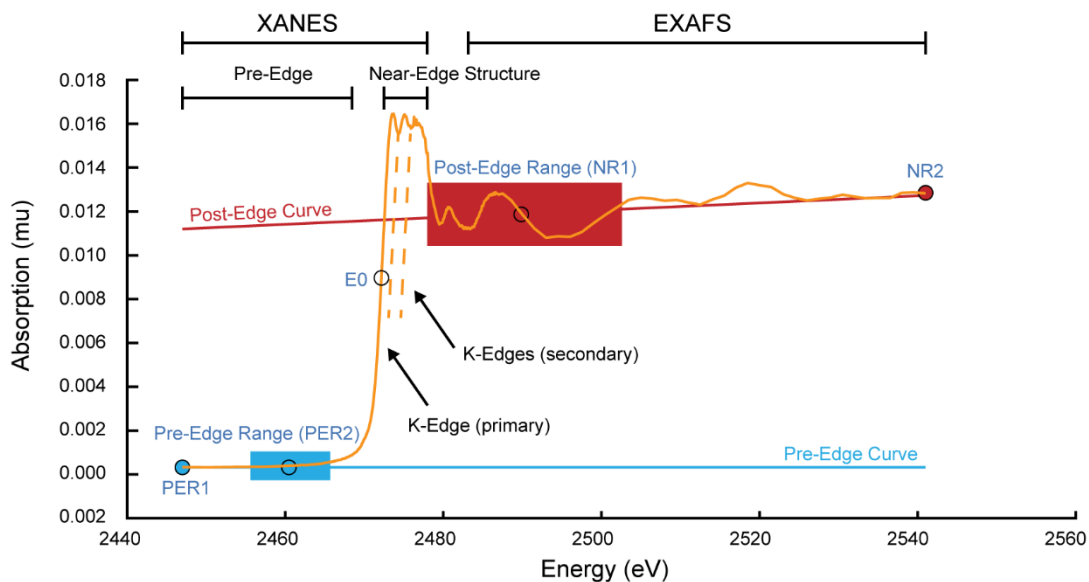


Figure S1. Raw X-Ray Absorption Spectroscopy (XAS) data for magnesium sulfide (MgS). K-edge XANES refers to the lower-energy region within ~50 eV of the absorption K-edge further subdivided into the pre-edge, k-edge, and near-edge structure. EXAFS is the oscillatory region ~30eV above the absorption edge that probes the local environment of atoms. Normalization of raw XAS spectra was completed using an edge-step normalization technique involving the pre-edge curve, post-edge curve, and E0 representing the k=0 continuum level at which electrons have just enough energy to propagate through material.

Figure S2

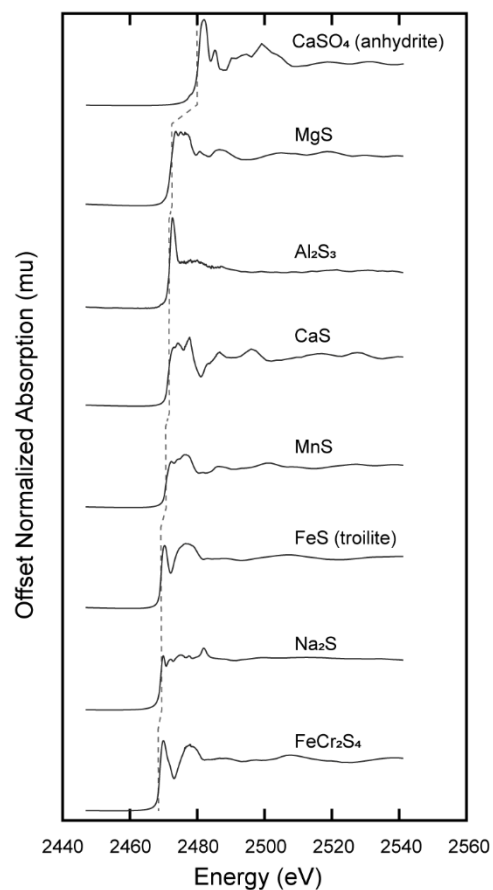


Figure S2. Flattened Sulfur K-edge XANES spectra for reference compounds and minerals. FeS (troilite), MnS (alabandite), CaS (oldhamite), MgS (niningerite), and CaSO_4 (anhydrite) spectra are comparable to previous studies (e.g. Fleet, 2005), however MgS has three near-edge peaks as opposed to two (Fleet, 2005). FeCr_2S_4 , Na_2S , and Al_2S_3 were measured for the first time. The dashed line indicates E0 of the compound. The spectra were collected in total fluorescence yield.

Figure S3

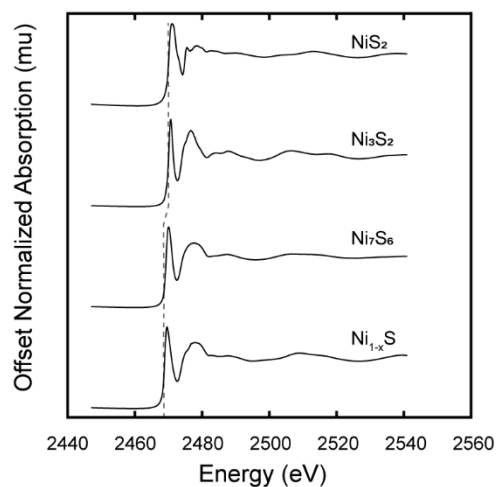


Figure S3. Flattened Sulfur K-edge XANES spectra for nickel sulfides. Ni_{1-x}S is comparable to Fleet (2005). The S K-edge moves to higher energies in progression of Ni_{1-x}S , Ni_7S_6 , Ni_3S_2 , to NiS_2 . The dashed line indicates E_0 of the compound. The spectra were collected in total fluorescence yield.