



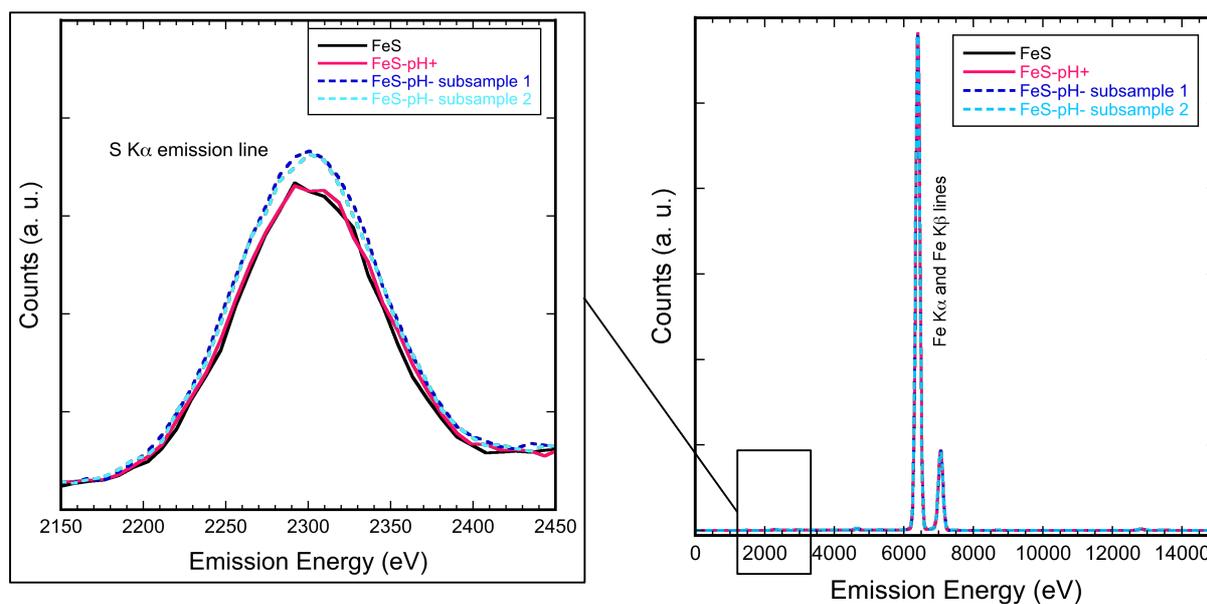
*Supplement of*

**Mackinawite transformation into greigite at room temperature under anoxic and acidic conditions: a corrosion pathway?**

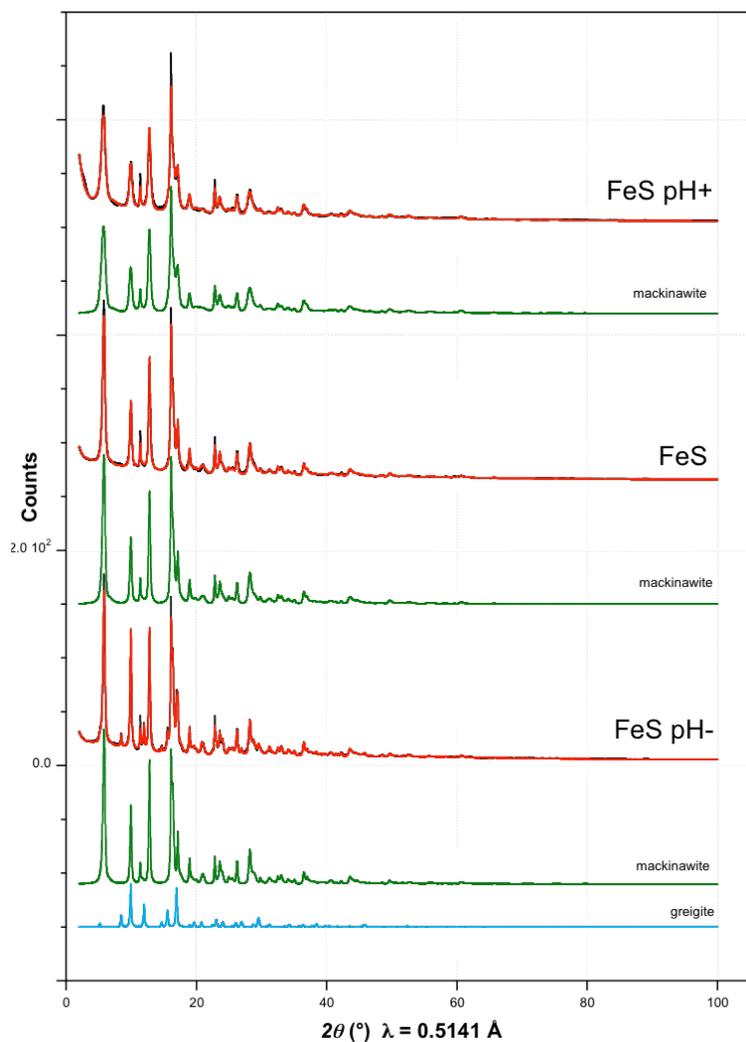
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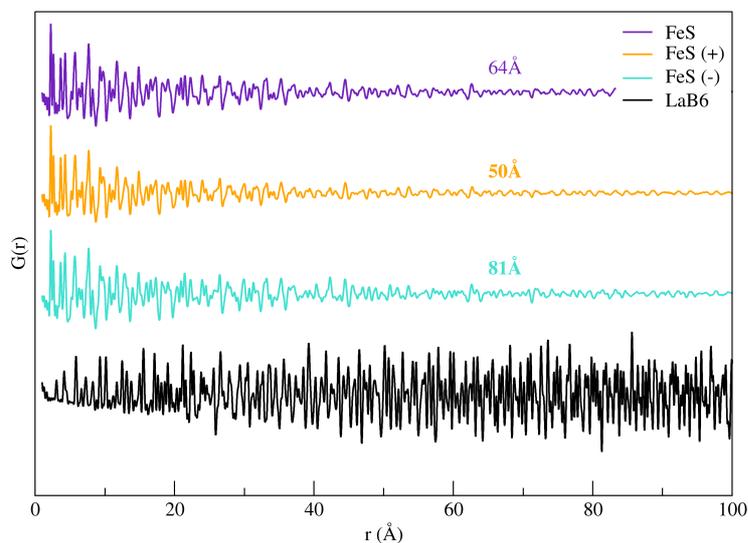
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**Figure S1.** X-Ray emission spectra obtained for the three samples in air using a Mo rotating anode. Spectra are normalized to the Fe  $K\alpha$  line, and a zoom is presented on the intensity of the S  $K\alpha$  line. This analysis shows that the FeS-pH- (here called “FeSm”) sample is enriched in S, which is in agreement with the presence of 19 wt%  $\text{Fe}_3\text{S}_4$  compared to the two other samples that contain only FeS (FeS for the control and FeSp for FeS-pH+). The FeS-pH- measurement was performed twice on two distinct pellets (FeSm1 and FeSm2).

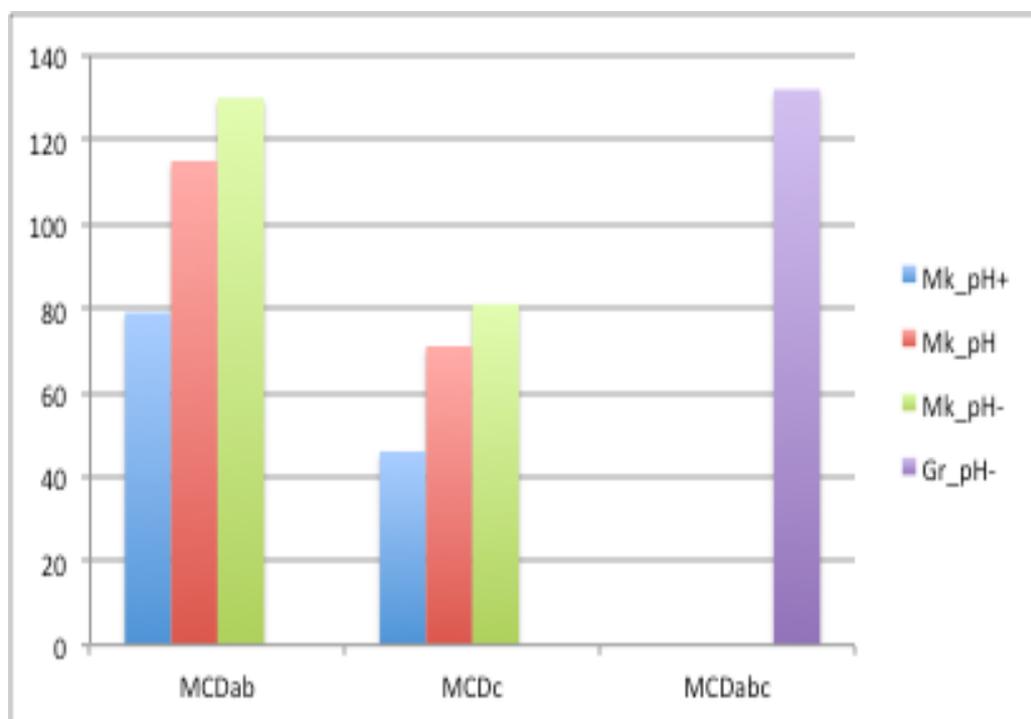


(a)

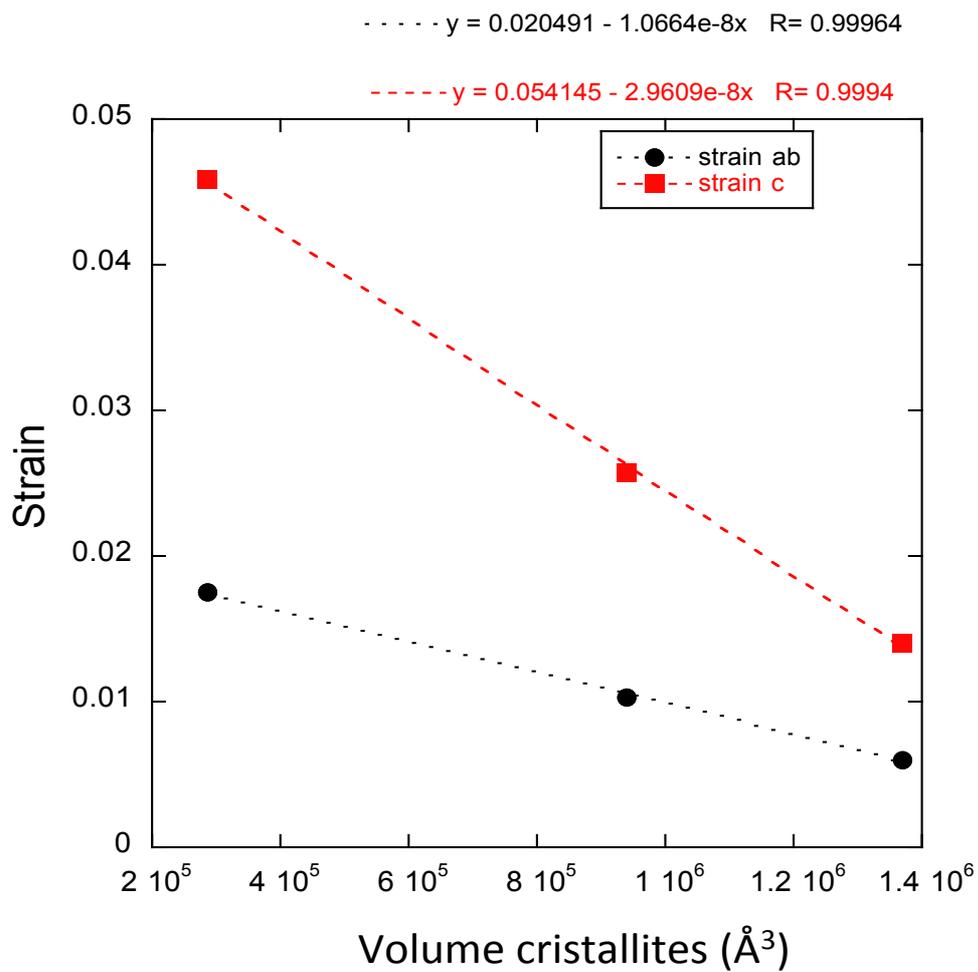


(b)

**Figure S2 (a, b)** (a) Rietveld refined XRD powder patterns for the three samples studied. Experimental and calculated curves are displayed as black and red color lines, respectively, and mackinawite and greigite components, as green and blue color lines, respectively. Refinement parameters are reported in Table 2. (b) Comparison of the particle sizes for the three sample studied based on the PDF analysis and compared to the crystalline LaB<sub>6</sub> reference compound measured in the same conditions.



**Figure S3.** Size of the mean coherent domains (MCD) for the three samples studied and determined by Rietveld refinement of X-ray diffractograms (Figure 2, Table 2).



**Figure S4.** Strain estimated along the  $ab$  and  $c$  directions as a function of the crystallite volume calculated from  $MCD_{ab}$  and  $MCD_c$  and assuming platelet shape.