materials

MDPI

Supplementary Information

Thermal Stability and Decomposition Products of P-Doped Ferrihydrite

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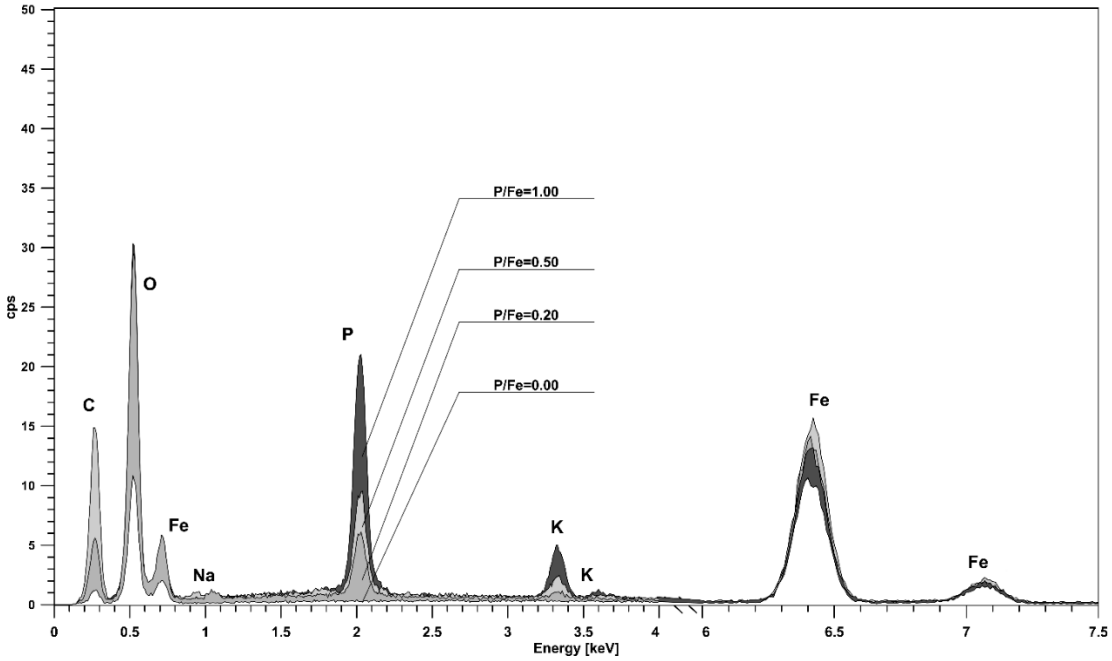


Figure S1. Comparison of EDS spectra of pure and P-doped ferrihydrites.

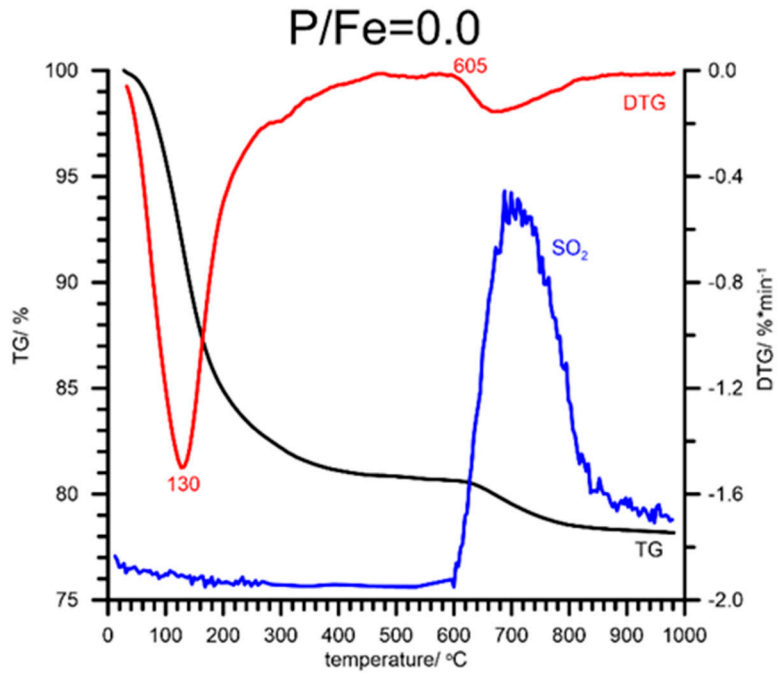


Figure S2. Quadrupole mass spectrometry (QMS) signal recording a release of SO_2 between 600 and 800 °C.

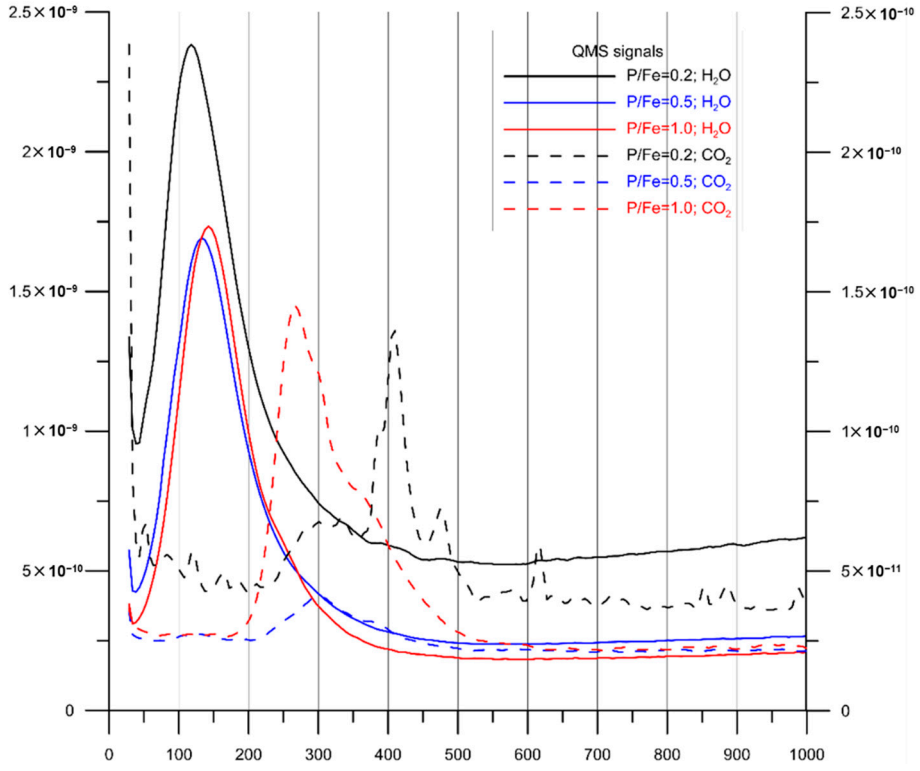


Figure S3. Quadrupole mass spectrometry (QMS) signal recording a release of H_2O and CO_2 upon heating of P-doped ferrihydrite.

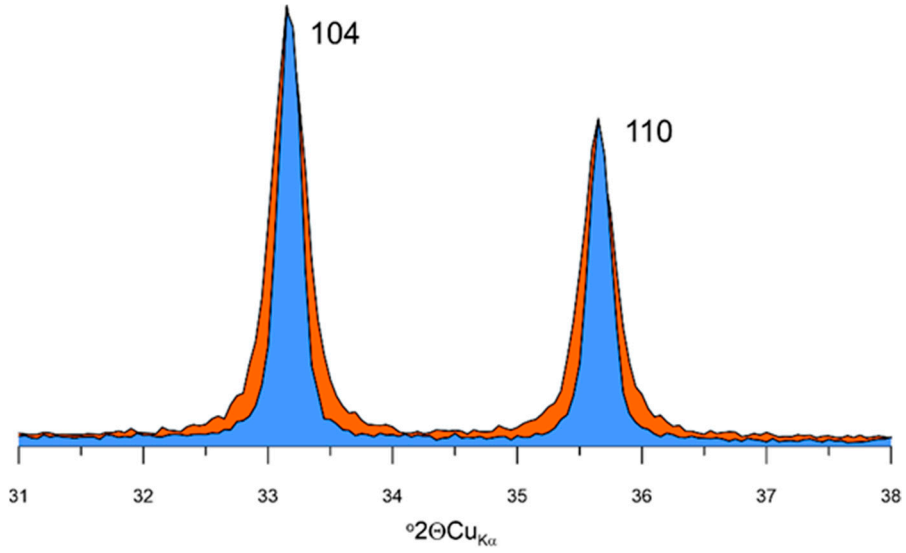


Figure S4. Fragment of XRD pattern of hematite resulting from heating of sample FHYD-0.2 to 900 °C (narrower, blue pattern) and to 1000 °C (broader, red pattern) resulting probably from incorporation of P into hematite solid solution.

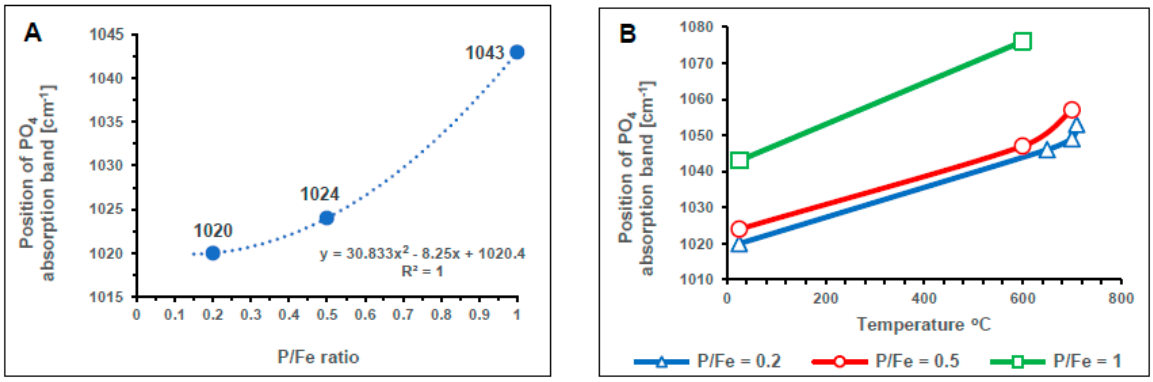
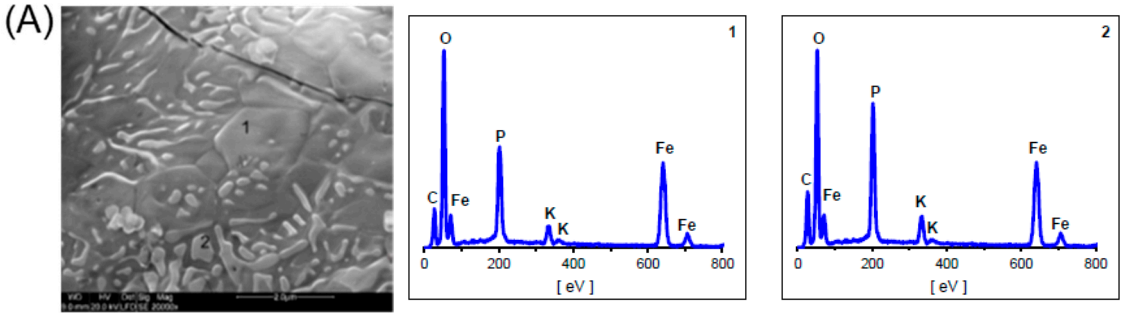


Figure S5. A. Systematic shift of the main PO4 absorption band position on IR spectra for P-doped ferrihydrites. The position of the band in the spectrum can be used to estimate the P content in ferrihydrite. **B**. The effect of temperature on the shift of absorption bands originating from PO4 is almost identical for P-poor and P-rich ferrihydrites.



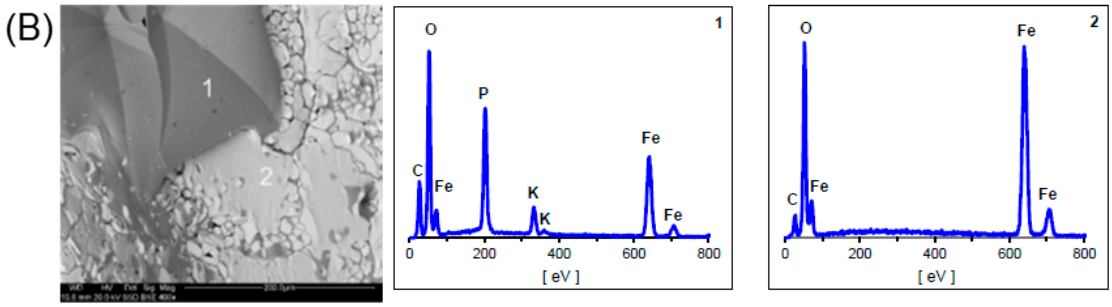


Figure S6. SEM image and EDS spectra of products of P-rich ferrihydrite (FHYD-1.0) heating to 800 °C (**A**) and to 1000 °C (**B**).

Table S1. Comparison of the position of major thermal effects apparent on DTA curves for pure and P-doped ferrihydrites.

	P/Fe	**0.0**	**0.2**	**0.5**	**1.0**
Dominating processes responsible for thermal effect		Temperature °C			
Removal of surface moisture	endo	137	133	141	146
Ferrihydrite collapse	exo	460	558	565	568
Formation of nanomaghemite	exo		658	680	677
Formation of Fe-phosphates and rodolicoite	exo		722	717	
Formation of hematite and transformation of Fe-phosphates	exo		855	865	860
Transformation of rodolicoite and formation of grattarolaite	exo			915	884