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Supplementary Data

Deposit[1]. XRD patterns of reagents with matching patterns from the ICDD database. a) reagent ferric sulfate, b) reagent ferrous sulfate.

a) Szomolnokite — XRD pattern with reference Szomolnokite (00-045-1365)

b) Melanterite — XRD pattern with reference Melanterite (00-022-0633)

c) Schwertmannite — XRD pattern with references Schwertmannite (00-047-1775) and Goethite (00-029-0713)

d) Jarosite — Jarosite (00-022-0827)

e) Hematite — Hematite (01-087-1165)

f) Magnetite — Magnetite (01-085-1436)
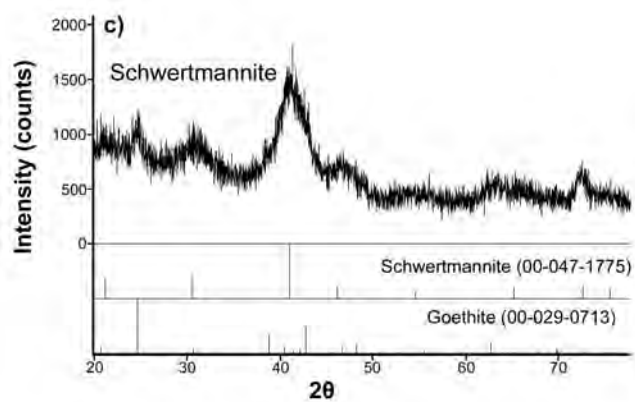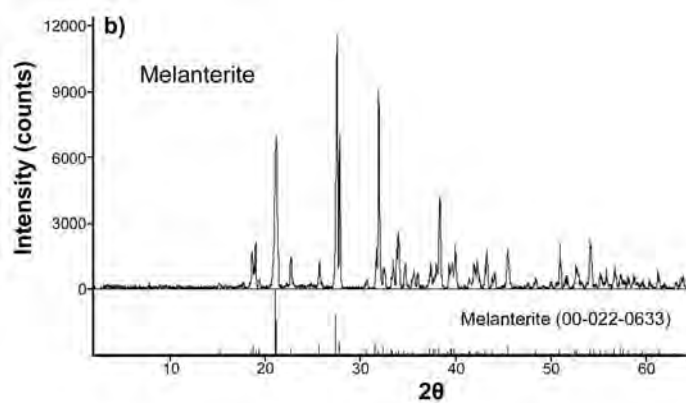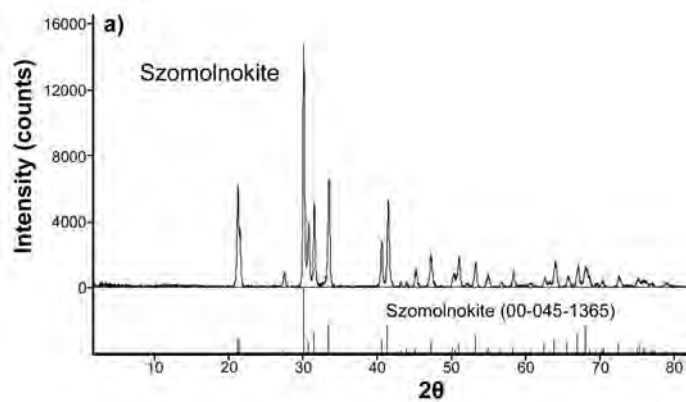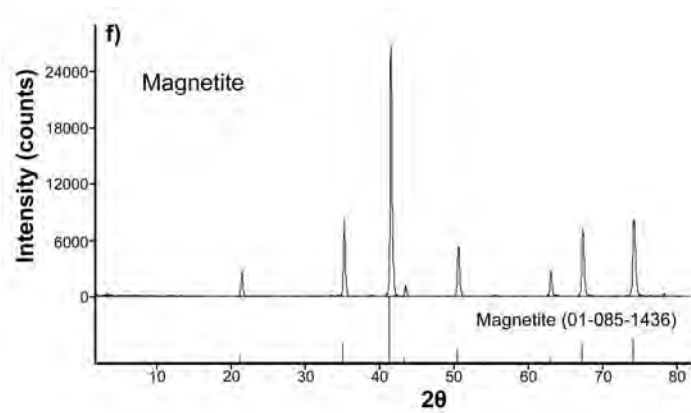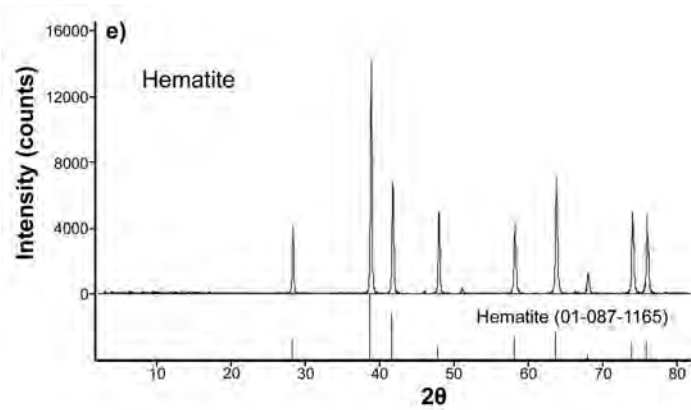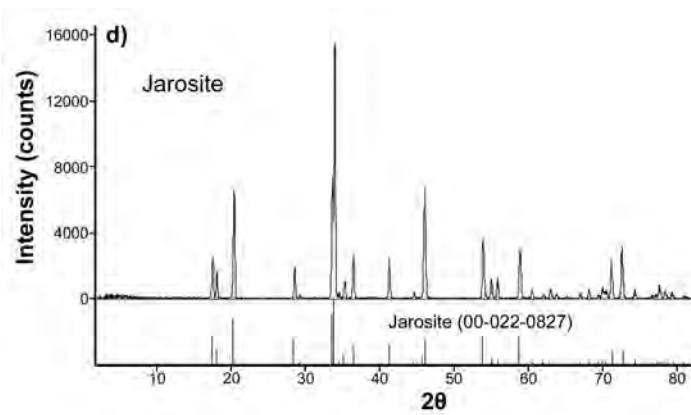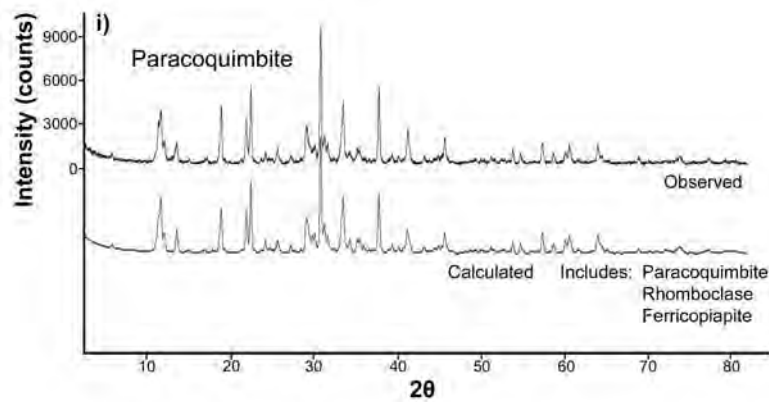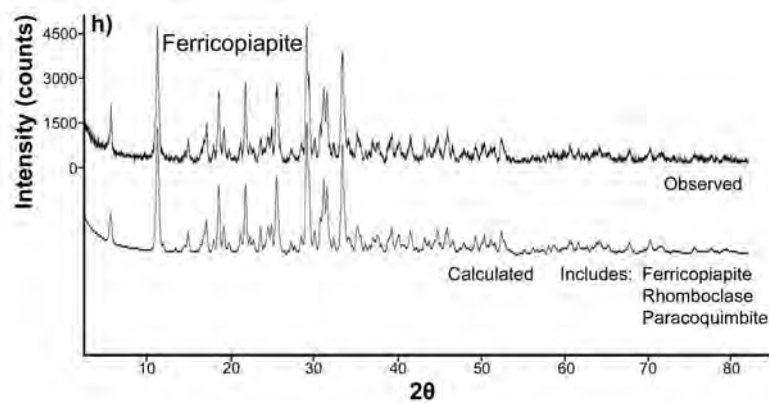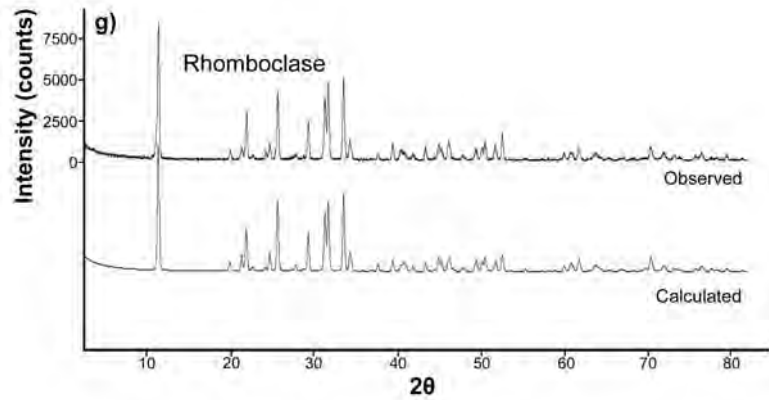
Deposit[2]. a)-i). XRD patterns a-f with matching patterns from the ICDD database. XRD patterns g-i with calculated patterns from known crystal structures. a) szomolnokite, b) melanterite, c) schwertmannite, d) jarosite, e) hematite, f) magnetite, g) rhomboclase, h) ferricopiapite, i) paracoquimbite.

Deposit[3]. Microanalysis standards used

Element	EPMA Calibration Standard	SEM Calibration Standard
C		[‡]Diamond
O	*Almandine	*Corundum
O	*Hematite	*Hematite
Na	*Albite	
Mg	*Dolomite	*Dolomite
Al, K	Orthoclase	
S	[†]Barite	Jarosite
K		*Muscovite
Ti	Rutile	
V	Vanadium Metal	
Mn	Spessartine	Spessartine
Fe (*K* line)	Hematite	Hematite
Fe (*L* line)		[‡]Iron Metal
Co	Cobalt Metal	Cobalt Metal
As	InAs	
Mo	$CaMoO_4$	

*McGuire et al. (1992)

[†]Permanent EPMA standard and could not be used for SEM analysis

[‡]Used for spectral deconvolution of the oxygen peak and background