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Supplementary Information

High-pressure Synthesis, Spin-Glass Behaviour, and Magnetocaloric Effect in $Fe_xTi_2S_4$ Heideite Sulphides

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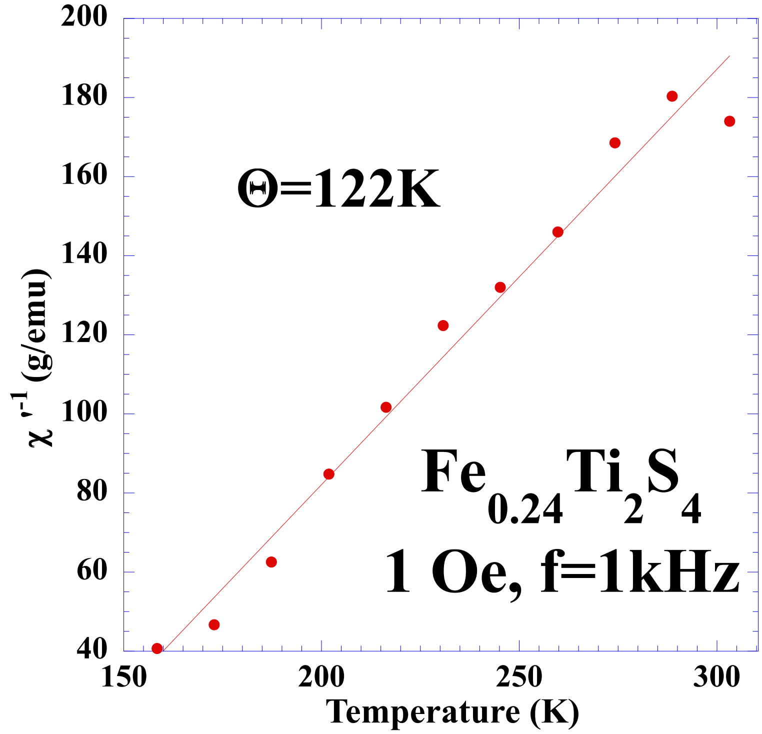
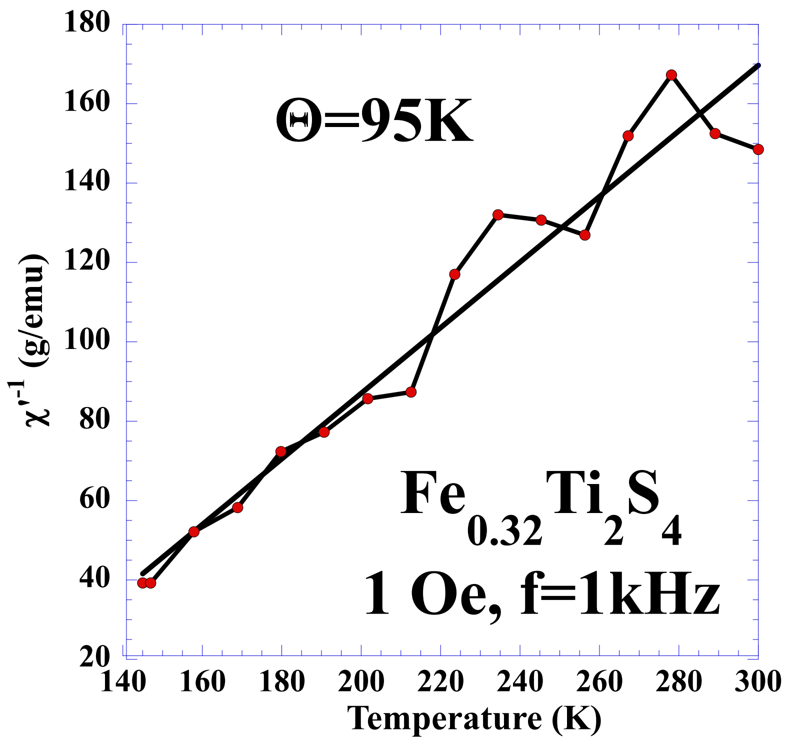
Table S1. Elemental composition (atomic %) of the samples. Percentage of the different oxidation states found in the analysis of the Ti 2*p* core level peak.

	Composition (% at)						***Ti 2p***		
Samples	**Fe**	**Ti**	**S**	**O**	**C**	**N**	**%Ti^{2+}**	**%Ti^{3+}**	**%Ti^{4+}**
$\mathbf{Fe_{0.24}Ti_2S_4}$	2.6	6.3	5.9	41.0	44.2	0.0	33.5	62.4	4.1
$\mathbf{Fe_{0.32}Ti_2S_4}$	2.8	5.1	4.3	37.9	49.3	0.6	45.5	49.1	5.4
$\mathbf{Fe_{0.42}Ti_2S_4}$	1.1	2.0	3.1	23.8	69.3	0.7	19.4	75.1	5.5



200
180
160
140
120
100
80
60
40
150
200
250
300
Θ=122K
χ'^{-1} (g/emu)
$Fe_{0.24}Ti_2S_4$
1 Oe, f=1kHz
Temperature (K)



180
160
140
120
100
80
60
40
20
140
160
180
200
220
240
260
280
300
Θ=95K
χ'^{-1} (g/emu)
$Fe_{0.32}Ti_2S_4$
1 Oe, f=1kHz
Temperature (K)

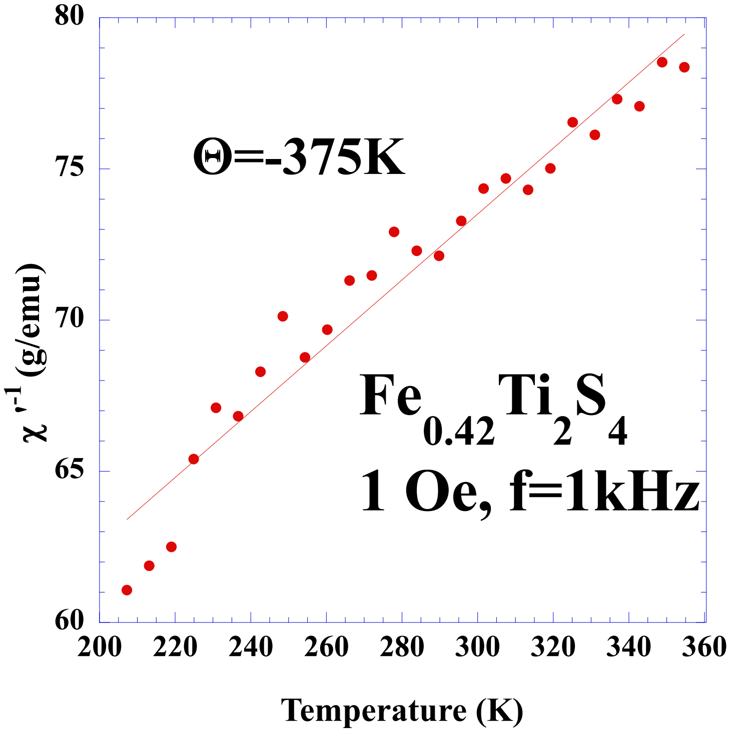


Figure S1: Curie-Weiss fitting of the inverse of the real part of the *ac* magnetic susceptibility measured at $f = 1$ kHz with an amplitude of 1 Oe in the temperature range from 150 K to 300 K, and 320 K to 355 K, for the $x = 0.24$ and 0.32, and $x = 0.42$, respectively.