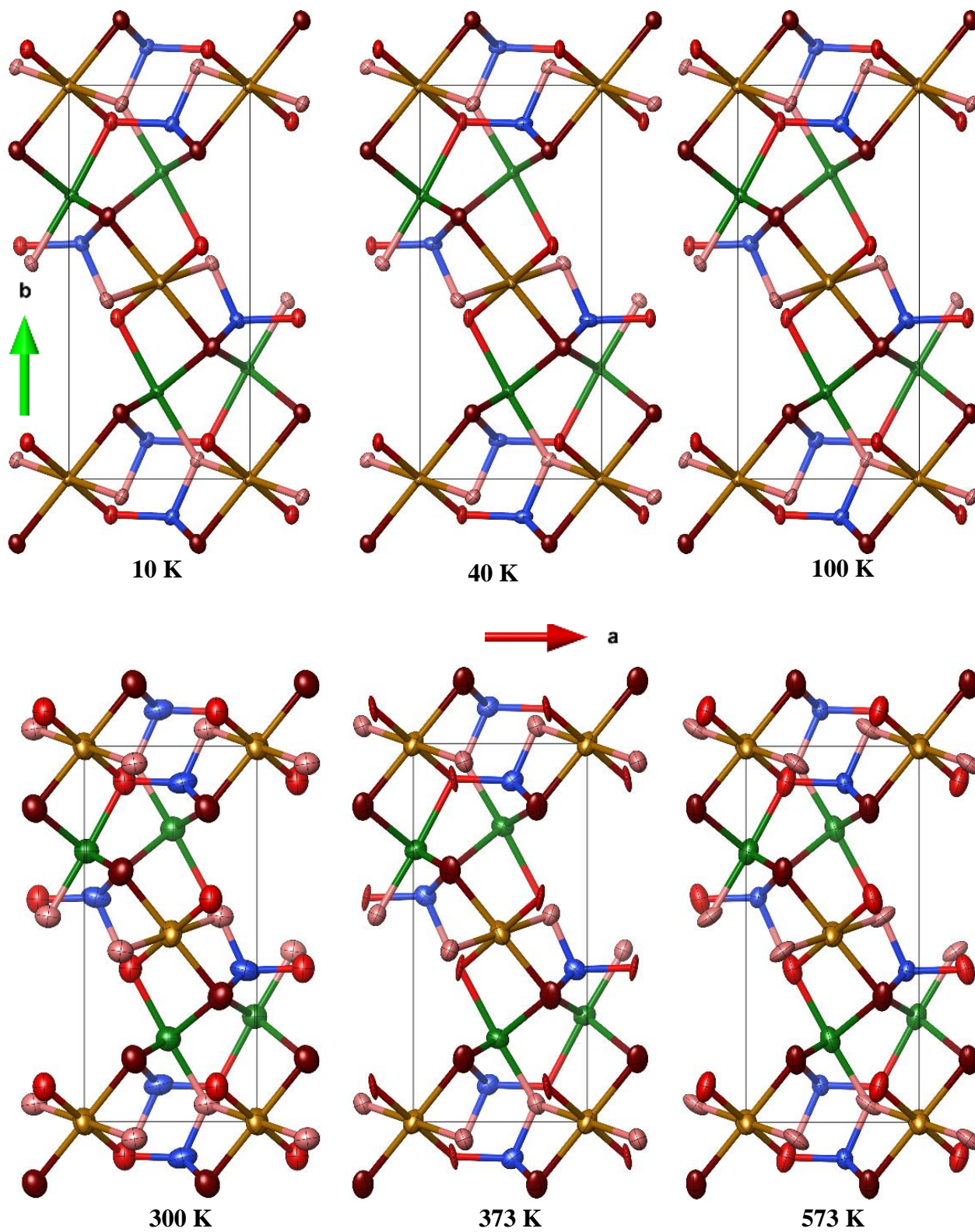
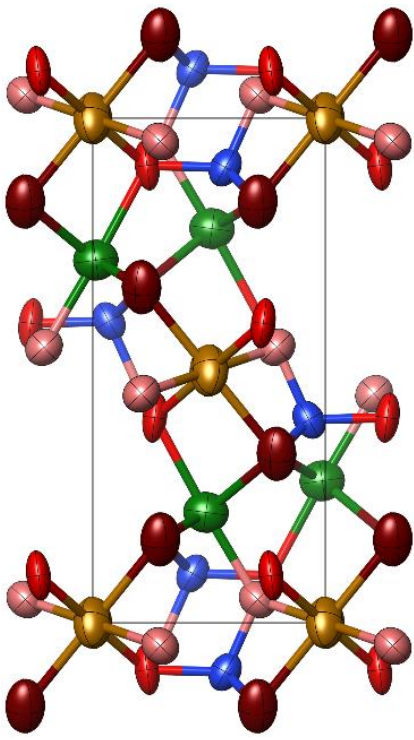


Supplementary Information

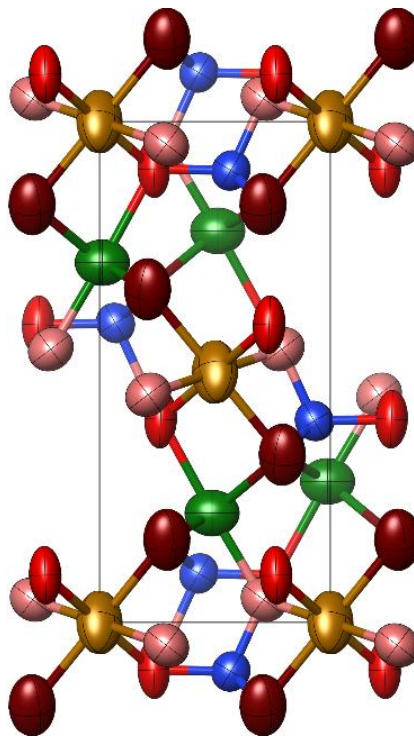
1

2 **Fig. 1.** Anisotropic displacement ellipsoids from the refinements at:

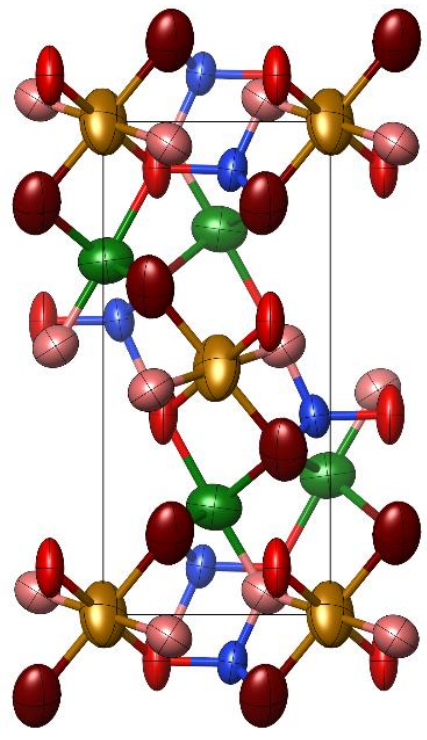




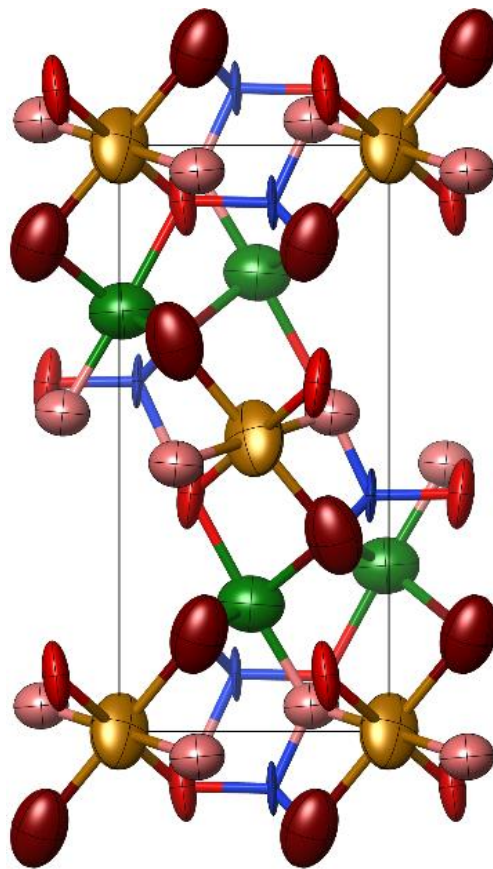
873 K



1173 K



1353 K



1453 K

7

8

9

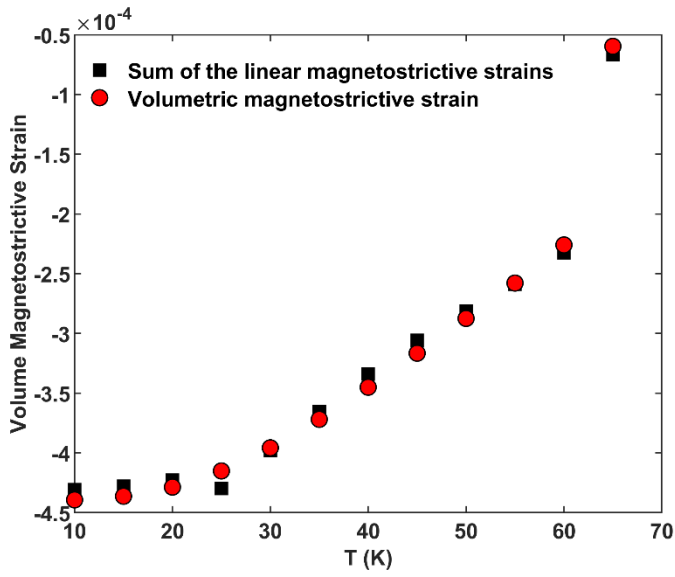
10

11 **Table 1.** Fitted values of the parameters used to model the magnetostrictive strains in  $\text{Fe}_2\text{SiO}_4$  as shown in Figs. 9 and 10  
 12 of the paper (numbers in parenthesis are one standard error of the least significant digit).

	<i>Paramagnetic Phase</i>			<i>Antiferromagnetic Phase</i>		
	$X_0$ (Å)	$\theta_D$ (K)	$Q$ (J)	$A_{65}$ (Å)	$A_{23}$ (Å)	$\beta$
<i>a</i>	4.816(3)	621(6)	$1.62(5) \times 10^{-16}$	-0.0001(2)	-0.00018(8)	1.59(7)
<i>b</i>	10.456*			0.0007(1)	-0.0026(1)	0.22(3)
<i>c</i>	6.081(7)	631(9)	$9.78(1) \times 10^{-16}$	0.0003(2)	0.00129(5)	1.11(5)
<i>V</i>	306.210(2)	329(16)	$4.97(3) \times 10^{-17}$	-0.0057(1)	-0.0840(2)	0.39(1)

13 \* The value for  $b_0$  was calculated from  $V_0/(a_0c_0)$ .

14  
 15 **Fig. 2:** Volumetric magnetostrictive strain calculated: (i) directly from the unit-cell volume (red symbols) and (ii) indirectly  
 16 from the sum of the axial strains. The close agreement between the two methods shows the self-consistency of the  
 17 methodology (for details see main text).



18

19 **Table 2.** Fe-O bond lengths of paramagnetic Fe<sub>2</sub>SiO<sub>4</sub> (numbers in parenthesis are one standard error of the least  
 20 significant digit).

<i>T</i> (K)	<i>Fe1</i> ( <i>M1</i> ) site			<i>Fe2</i> ( <i>M2</i> ) site			
	<i>Fe1-O1</i> Å	<i>Fe1-O2</i> Å	<i>Fe1-O3</i> Å	<i>Fe2-O1</i> Å	<i>Fe2-O2</i> Å	<i>Fe2-O3(1)</i> Å	<i>Fe2-O3(2)</i> Å
<i>Closed-Cycle Refrigerator</i>							
10	2.115(1)	2.125(1)	2.230(1)	2.227(2)	2.102(2)	2.291(1)	2.061(1)
15	2.116(1)	2.124(1)	2.231(1)	2.226(2)	2.101(2)	2.290(1)	2.061(1)
20	2.117(1)	2.125(1)	2.232(1)	2.228(2)	2.102(2)	2.290(1)	2.061(1)
25	2.116(1)	2.126(1)	2.229(1)	2.228(2)	2.102(2)	2.291(1)	2.062(1)
30	2.118(1)	2.125(1)	2.231(1)	2.228(2)	2.102(2)	2.291(1)	2.062(1)
35	2.117(1)	2.126(1)	2.232(1)	2.227(2)	2.101(2)	2.290(1)	2.062(1)
40	2.118(1)	2.127(1)	2.230(1)	2.226(2)	2.103(2)	2.292(1)	2.061(1)
45	2.115(1)	2.124(1)	2.230(1)	2.227(2)	2.102(2)	2.291(1)	2.061(1)
50	2.117(1)	2.125(1)	2.231(1)	2.228(2)	2.102(2)	2.291(1)	2.062(1)
55	2.117(1)	2.127(1)	2.232(1)	2.228(2)	2.103(2)	2.292(2)	2.062(1)
60	2.117(1)	2.125(1)	2.232(1)	2.228(2)	2.102(2)	2.291(2)	2.062(1)
65	2.118(1)	2.126(1)	2.231(1)	2.229(2)	2.103(2)	2.291(2)	2.062(1)
70	2.118(1)	2.127(1)	2.230(1)	2.227(2)	2.103(2)	2.290(6)	2.066(1)
75	2.116(2)	2.124(1)	2.232(1)	2.228(2)	2.105(2)	2.289(2)	2.063(1)
80	2.120(1)	2.127(1)	2.229(1)	2.229(2)	2.102(2)	2.292(1)	2.062(1)
85	2.117(1)	2.125(1)	2.232(1)	2.228(2)	2.104(2)	2.287(1)	2.064(1)
90	2.117(1)	2.126(1)	2.231(1)	2.228(2)	2.102(2)	2.291(1)	2.063(1)
100	2.115(1)	2.126(1)	2.232(1)	2.224(2)	2.105(2)	2.290(1)	2.063(1)
110	2.118(1)	2.126(1)	2.232(1)	2.229(2)	2.103(2)	2.292(1)	2.061(1)
120	2.117(1)	2.127(1)	2.231(1)	2.232(2)	2.104(2)	2.289(1)	2.064(1)
130	2.117(1)	2.126(1)	2.231(1)	2.225(2)	2.104(2)	2.291(1)	2.063(1)
140	2.118(1)	2.126(1)	2.233(1)	2.229(2)	2.103(2)	2.293(1)	2.059(1)
150	2.118(1)	2.126(1)	2.234(1)	2.229(2)	2.104(2)	2.290(1)	2.063(1)
160	2.120(1)	2.126(1)	2.231(1)	2.229(2)	2.107(2)	2.205(1)	2.064(1)
170	2.120(1)	2.128(1)	2.234(1)	2.226(2)	2.105(2)	2.287(1)	2.066(1)
180	2.121(1)	2.127(1)	2.235(1)	2.226(2)	2.102(2)	2.292(1)	2.062(1)
190	2.121(1)	2.127(1)	2.233(1)	2.230(2)	2.103(2)	2.294(1)	2.062(1)
200	2.119(1)	2.128(1)	2.236(1)	2.235(2)	2.103(2)	2.291(1)	2.063(1)
210	2.118(1)	2.128(1)	2.237(1)	2.230(2)	2.102(2)	2.295(1)	2.062(1)
220	2.121(1)	2.127(1)	2.235(1)	2.233(2)	2.104(2)	2.294(1)	2.063(1)
230	2.118(1)	2.126(1)	2.237(1)	2.229(2)	2.110(2)	2.291(1)	2.064(1)
240	2.121(1)	2.126(1)	2.237(1)	2.235(2)	2.108(2)	2.295(1)	2.060(1)
250	2.122(1)	2.126(1)	2.234(1)	2.230(2)	2.112(2)	2.294(1)	2.063(1)
260	2.123(1)	2.126(1)	2.236(1)	2.232(2)	2.111(2)	2.295(1)	2.062(1)

270	2.123(1)	2.130(1)	2.238(1)	2.233(2)	2.105(2)	2.291(1)	2.065(1)
280	2.123(1)	2.130(1)	2.236(1)	2.231(2)	2.103(2)	2.296(1)	2.064(1)
290	2.123(1)	2.126(1)	2.236(1)	2.231(2)	2.112(2)	2.296(1)	2.064(1)
300	2.122(1)	2.128(1)	2.234(1)	2.235(2)	2.112(2)	2.299(1)	2.063(1)
310	2.123(1)	2.127(1)	2.237(1)	2.233(2)	2.109(2)	2.296(1)	2.064(1)
320	2.125(1)	2.125(1)	2.237(1)	2.234(2)	2.109(2)	2.298(1)	2.065(1)
330	2.125(1)	2.129(1)	2.240(1)	2.236(2)	2.109(2)	2.299(1)	2.062(1)
340	2.123(1)	2.128(1)	2.238(1)	2.236(2)	2.112(2)	2.294(1)	2.066(1)
<i>TZM furnace</i>							
297	2.120(1)	2.127(1)	2.236(1)	2.228(3)	2.104(3)	2.299(2)	2.059(2)
373	2.122(1)	2.128(1)	2.239(1)	2.230(2)	2.106(2)	2.300(2)	2.060(1)
393	2.125(2)	2.125(2)	2.236(2)	2.230(3)	2.112(4)	2.298(2)	2.063(2)
413	2.123(2)	2.130(2)	2.239(2)	2.231(3)	2.103(4)	2.301(3)	2.062(2)
433	2.129(2)	2.125(2)	2.240(2)	2.230(3)	2.114(3)	2.296(2)	2.067(2)
453	2.128(2)	2.130(2)	2.238(2)	2.233(3)	2.105(3)	2.299(3)	2.070(2)
473	2.132(2)	2.128(2)	2.239(2)	2.225(3)	2.113(3)	2.302(3)	2.068(2)
493	2.129(2)	2.124(2)	2.241(2)	2.231(3)	2.121(3)	2.298(2)	2.071(2)
513	2.131(2)	2.130(2)	2.241(2)	2.235(3)	2.105(3)	2.304(3)	2.069(2)
533	2.130(2)	2.133(2)	2.243(2)	2.233(3)	2.106(4)	2.299(3)	2.073(2)
553	2.134(2)	2.132(2)	2.243(2)	2.236(3)	2.104(4)	2.299(3)	2.074(2)
573	2.134(1)	2.130(1)	2.242(1)	2.235(2)	2.109(2)	2.301(2)	2.073(1)
593	2.132(2)	2.132(2)	2.243(2)	2.238(3)	2.107(3)	2.304(3)	2.074(2)
613	2.135(2)	2.129(2)	2.240(2)	2.241(3)	2.110(4)	2.304(3)	2.077(2)
633	2.137(2)	2.133(2)	2.243(2)	2.240(3)	2.110(4)	2.308(3)	2.072(2)
653	2.139(2)	2.131(2)	2.247(2)	2.237(3)	2.108(4)	2.311(3)	2.071(2)
673	2.135(2)	2.136(2)	2.241(2)	2.241(3)	2.108(4)	2.305(3)	2.079(2)
693	2.136(2)	2.135(2)	2.248(2)	2.239(3)	2.105(3)	2.304(3)	2.076(2)
713	2.138(2)	2.134(2)	2.244(2)	2.241(3)	2.110(3)	2.305(3)	2.077(2)
733	2.139(2)	2.132(2)	2.242(2)	2.243(4)	2.109(4)	2.308(3)	2.079(2)
753	2.141(2)	2.132(2)	2.245(2)	2.246(4)	2.109(4)	2.313(3)	2.077(2)
773	2.139(2)	2.131(2)	2.244(2)	2.243(4)	2.115(4)	2.306(3)	2.086(2)
793	2.143(2)	2.135(2)	2.246(2)	2.242(4)	2.113(4)	2.314(3)	2.081(2)
813	2.140(2)	2.135(2)	2.248(2)	2.250(4)	2.114(4)	2.315(3)	2.078(2)
833	2.144(2)	2.137(2)	2.249(2)	2.249(4)	2.107(4)	2.320(3)	2.077(2)
853	2.142(2)	2.133(2)	2.247(2)	2.245(4)	2.120(4)	2.311(3)	2.083(2)
873	2.147(1)	2.134(1)	2.247(1)	2.247(2)	2.123(2)	2.313(2)	2.081(1)
893	2.148(2)	2.138(2)	2.247(2)	2.250(4)	2.108(4)	2.318(3)	2.083(2)
913	2.149(2)	2.137(2)	2.249(2)	2.256(4)	2.116(4)	2.316(3)	2.085(2)
933	2.147(2)	2.136(2)	2.249(2)	2.254(4)	2.117(4)	2.313(3)	2.088(2)

953	2.143(2)	2.137(2)	2.247(2)	2.248(4)	2.120(4)	2.315(3)	2.089(2)
973	2.147(2)	2.138(2)	2.252(2)	2.251(4)	2.120(4)	2.322(3)	2.083(3)
993	2.149(2)	2.138(2)	2.251(2)	2.259(4)	2.116(4)	2.323(3)	2.085(3)
1013	2.154(2)	2.137(2)	2.249(3)	2.252(4)	2.117(4)	2.324(3)	2.087(3)
1033	2.152(2)	2.134(2)	2.252(3)	2.251(4)	2.126(4)	2.327(3)	2.085(3)
1053	2.150(2)	2.136(2)	2.253(3)	2.251(4)	2.127(4)	2.325(3)	2.086(3)
1073	2.154(2)	2.138(2)	2.258(2)	2.257(4)	2.130(4)	2.314(3)	2.090(3)
1093	2.155(2)	2.137(2)	2.252(3)	2.247(4)	2.126(5)	2.317(4)	2.095(3)
1113	2.157(2)	2.143(2)	2.258(3)	2.259(4)	2.122(5)	2.323(3)	2.092(3)
1133	2.156(2)	2.136(2)	2.257(3)	2.254(5)	2.137(5)	2.316(4)	2.100(3)
1153	2.158(2)	2.139(2)	2.260(3)	2.262(4)	2.124(5)	2.321(3)	2.097(3)
1173	2.161(1)	2.138(1)	2.262(2)	2.257(3)	2.129(3)	2.319(2)	2.097(2)
1193	2.162(2)	2.137(3)	2.263(3)	2.252(5)	2.130(5)	2.323(4)	2.092(3)
1213	2.165(2)	2.140(2)	2.265(3)	2.257(5)	2.131(5)	2.321(4)	2.095(3)
1233	2.163(2)	2.136(2)	2.265(3)	2.257(5)	2.136(5)	2.319(4)	2.100(3)
1253	2.165(2)	2.138(2)	2.268(3)	2.263(5)	2.134(5)	2.328(4)	2.096(3)
1273	2.162(2)	2.138(2)	2.265(3)	2.263(5)	2.136(5)	2.319(4)	2.102(3)
1293	2.166(2)	2.145(2)	2.273(3)	2.267(4)	2.127(4)	2.328(3)	2.097(3)
1313	2.164(2)	2.142(2)	2.269(2)	2.270(4)	2.136(4)	2.322(3)	2.102(3)
1333	2.167(2)	2.142(2)	2.274(3)	2.257(4)	2.141(5)	2.321(3)	2.101(3)
1353	2.168(2)	2.143(2)	2.269(3)	2.279(4)	2.131(5)	2.327(3)	2.102(3)
1373	2.166(2)	2.144(2)	2.272(3)	2.270(5)	2.134(5)	2.325(4)	2.110(3)
1393	2.172(2)	2.142(2)	2.268(3)	2.274(5)	2.132(5)	2.330(4)	2.110(3)
1413	2.158(2)	2.134(2)	2.255(3)	2.271(5)	2.173(5)	2.327(4)	2.115(3)
1433	2.168(2)	2.144(2)	2.276(3)	2.268(5)	2.152(5)	2.325(4)	2.113(3)
1453	2.169(1)	2.142(1)	2.279(1)	2.274(2)	2.146(3)	2.333(2)	2.106(1)

21

22 **Table 3.** O-Fe1-O angles of paramagnetic Fe<sub>2</sub>SiO<sub>4</sub> (numbers in parenthesis are one standard error of the least significant  
23 digit).

<i>O-Fe1-O angles ( ° )</i>						
<i>T(K)</i>	<i>O1-Fe1-O2(1)</i>	<i>O1-Fe1-O2(2)</i>	<i>O1-Fe1-O3(1)</i>	<i>O1-Fe1-O3(2)</i>	<i>O2-Fe1-O3(1)</i>	<i>O2-Fe1-O3(2)</i>
<i>Closed-Cycle Refrigerator</i>						
10	86.44(3)	93.50(4)	95.41(3)	84.59(4)	107.13(4)	72.88(4)
15	86.51(4)	93.51(5)	95.52(5)	84.56(5)	107.09(5)	72.91(5)
20	86.50(4)	93.48(5)	95.56(5)	84.44(5)	107.21(5)	72.80(5)
25	86.53(4)	93.47(5)	95.46(5)	84.54(5)	107.15(5)	72.71(5)
30	86.47(6)	93.42(5)	95.38(5)	84.62(6)	107.29(5)	72.85(5)
35	86.51(5)	93.56(5)	95.49(5)	84.51(5)	107.15(5)	72.81(5)

40	86.43(4)	93.41(4)	95.49(4)	84.51(4)	107.20 (4)	72.83(4)
45	86.59(5)	93.52(5)	95.51(5)	84.49(6)	107.17(5)	72.90(5)
50	86.41(5)	93.50(5)	95.41(5)	84.59(5)	107.21(5)	72.79(5)
55	86.55(5)	93.56(5)	95.57(6)	84.43(6)	107.19(5)	72.81(5)
60	86.47(5)	93.49(5)	95.55(5)	84.45(5)	107.25(5)	72.75(5)
65	86.49(5)	93.44(5)	95.76(5)	84.44(5)	107.21(5)	72.79(5)
70	86.55(5)	93.45(5)	95.45(6)	84.55(6)	107.15(5)	72.85(5)
75	86.43(5)	93.57(5)	95.40(6)	84.60(6)	107.16(5)	72.75(5)
80	86.63(5)	93.37(5)	95.38(6)	84.62(6)	107.19(5)	72.81(5)
85	86.51(5)	93.49(5)	95.50(6)	84.50(6)	107.18(5)	72.82(5)
90	86.53(5)	93.47(5)	95.47(6)	84.53(6)	107.18(5)	72.82(5)
100	86.43(5)	93.57(5)	95.53(6)	84.47(6)	107.20(5)	72.80(5)
110	86.53(5)	93.47(5)	95.39(6)	84.61(6)	107.18(5)	72.81(5)
120	86.55(5)	93.45(5)	95.38(6)	84.62(6)	107.27(5)	72.73(5)
130	86.50(5)	93.50(5)	95.51(6)	84.49(6)	107.16(5)	72.84(5)
140	86.51(5)	93.49(5)	95.40(6)	84.60(6)	107.18(5)	72.82(5)
150	86.52(5)	93.48(5)	95.43(6)	84.57(6)	107.20(5)	72.80(5)
160	86.55(5)	93.45(5)	95.53(6)	84.47(6)	107.28(5)	72.72(5)
170	86.59(5)	93.41(5)	95.53(6)	84.47(6)	107.25(5)	72.75(5)
180	86.57(5)	93.43(5)	95.48(6)	84.52(6)	107.17(5)	72.83(5)
190	86.55(5)	93.45(5)	95.48(6)	84.52(6)	107.26(5)	72.74(5)
200	86.55(5)	93.45(5)	95.47(6)	84.53(6)	107.25(5)	72.75(5)
210	86.54(5)	93.46(5)	95.48(6)	84.52(6)	107.19(5)	72.81(5)
220	86.54(5)	93.46(5)	95.47(6)	84.53(6)	107.30(5)	72.70(5)
230	86.41(5)	93.59(5)	95.34(6)	84.66(6)	107.35(5)	72.65(5)
240	86.49(5)	93.51(5)	95.46(6)	84.54(6)	107.31(5)	72.69(5)
250	86.50(5)	93.50(5)	95.39(6)	84.61(6)	107.37(5)	72.63(5)
260	86.51(5)	93.49(5)	95.54(6)	84.46(6)	107.27(5)	72.73(5)
270	86.58(5)	93.42(5)	95.54(6)	84.46(6)	107.40(5)	72.60(5)
280	86.59(5)	93.41(5)	95.50(6)	84.50(6)	107.32(5)	72.68(5)
290	86.44(5)	93.56(5)	95.40(6)	84.60(6)	107.41(5)	72.59(5)
300	86.46(5)	93.54(5)	95.50(3)	84.49(3)	107.47(5)	72.53(5)
310	86.48(6)	93.52(6)	95.50(7)	84.50(7)	107.34(6)	72.65(6)
320	86.49(6)	93.51(6)	95.42(7)	84.58(7)	107.44(6)	72.56(6)
330	86.56(6)	93.44(6)	95.9(7)	84.51(7)	107.42(5)	72.58(6)
340	86.47(12)	93.53(12)	95.62(14)	84.38(14)	107.42(12)	72.58(12)

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*TZM furnace*

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297	86.44(7)	93.55(7)	95.58(7)	84.41(7)	107.41(7)	72.58(7)
373	86.38(2)	93.61(2)	95.65(1)	84.34(1)	107.42(10)	72.57(10)

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393	86.36(4)	93.63(4)	95.60(10)	84.39(10)	107.45(2)	72.54(2)
413	86.41(6)	93.58(6)	95.70(1)	84.29(1)	107.54(4)	72.45(4)
433	86.39(10)	93.60(10)	95.75(5)	84.24(5)	107.65(10)	72.34(10)
453	86.53(3)	93.47(3)	95.63(9)	84.36(9)	107.56(3)	72.43(3)
473	86.45(3)	93.54(3)	95.83(8)	84.16(8)	107.66(10)	72.33(10)
493	86.24(1)	93.75(1)	95.72(7)	84.27(7)	107.80(6)	72.19(6)
513	86.51(2)	93.48(2)	95.69(1)	84.30(1)	107.63(4)	72.36(4)
533	86.52(3)	93.47(3)	95.77(1)	84.22(1)	107.73(4)	72.26(4)
553	86.55(5)	93.44(5)	95.80(1)	84.19(1)	107.70(5)	72.29(5)
573	86.46(5)	93.53(5)	95.74(4)	84.25(4)	107.70(6)	72.29(6)
593	86.43(3)	93.56(3)	95.71(10)	84.28(10)	107.78(3)	72.21(3)
613	86.41(6)	93.58(6)	95.65(3)	84.34(3)	107.79(7)	72.21(7)
633	86.50(7)	93.49(7)	95.63(5)	84.36(5)	107.81(8)	72.18(8)
653	86.47(3)	93.52(3)	95.71(2)	84.28(2)	107.79(7)	72.20(7)
673	86.46(6)	93.53(6)	95.71(2)	84.28(2)	107.92(7)	72.07(7)
693	86.41(8)	93.58(8)	95.89(5)	84.10(5)	107.74(8)	72.25(8)
713	86.41(7)	93.58(7)	95.81(5)	84.19(5)	107.82(8)	72.17(8)
733	86.38(8)	93.61(8)	95.74(6)	84.25(6)	107.74(8)	72.25(8)
753	86.42(8)	93.58(8)	95.61(7)	84.38(7)	107.79(2)	72.20(2)
773	86.25(2)	93.74(2)	95.88(9)	84.11(9)	108.01(3)	71.99(3)
793	86.44(1)	93.56(1)	95.74(7)	84.25(7)	107.98(2)	72.01(2)
813	86.35(3)	93.64(3)	95.56(2)	84.43(2)	107.98(6)	72.01(6)
833	86.54(1)	93.45(1)	95.49(10)	84.50(10)	107.79(6)	72.20(6)
853	86.26(5)	93.73(5)	95.73(4)	84.26(4)	107.96(7)	72.03(7)
873	86.36(1)	93.63(1)	95.58(3)	84.41(3)	108.04(10)	71.95(10)
893	86.50(2)	93.49(2)	95.74(9)	84.25(9)	107.93(6)	72.07(6)
913	86.52(3)	93.47(3)	95.49(1)	84.50(1)	108.07(6)	71.92(6)
933	86.36(7)	93.63(7)	95.65(7)	84.34(7)	108.07(8)	71.92(8)
953	86.22(9)	93.77(9)	95.79(10)	84.20(10)	108.10(9)	71.90(9)
973	86.36(10)	93.64(10)	95.60(1)	84.39(1)	108.08(1)	71.91(1)
993	86.42(10)	93.57(10)	95.51(2)	84.48(2)	108.08(4)	71.91(4)
1013	86.45(1)	93.54(1)	95.65(5)	84.34(5)	108.07(4)	71.92(4)
1033	86.30(2)	93.69(2)	95.54(6)	84.45(6)	108.07(6)	71.92(6)
1053	86.26(1)	93.73(1)	95.61(5)	84.38(5)	108.08(6)	71.91(6)
1073	86.30(3)	93.69(3)	95.66(6)	84.33(6)	108.25(3)	71.74(3)
1093	86.33(5)	93.66(5)	95.91(3)	84.08(3)	108.01(9)	71.98(9)
1113	86.56(2)	93.43(2)	95.56(1)	84.43(1)	108.24(7)	71.75(7)
1133	86.17(1)	93.82(1)	95.80(5)	84.19(5)	108.53(9)	71.46(9)
1153	86.37(5)	93.62(5)	95.63(1)	84.36(1)	108.32(9)	71.67(9)

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1173	86.38(6)	93.62(6)	95.73(1)	84.26(1)	108.27(7)	71.73(7)
1193	86.30(4)	93.69(4)	95.77(8)	84.22(8)	108.07(10)	71.92(10)
1213	86.41(9)	93.58(9)	95.69(4)	84.30(4)	108.32(10)	71.67(10)
1233	86.24(1)	93.75(1)	95.76(9)	84.24(9)	108.36(4)	71.63(4)
1253	86.32(9)	93.67(9)	95.63(8)	84.36(8)	108.36(3)	71.63(3)
1273	86.17(1)	93.82(1)	95.75(10)	84.24(10)	108.35(2)	71.65(2)
1293	86.43(8)	93.56(8)	95.65(6)	84.34(6)	108.42(3)	71.57(3)
1313	86.27(9)	93.72(9)	95.48(6)	84.51(6)	108.44(1)	71.56(1)
1333	86.21(4)	93.78(4)	95.92(9)	84.07(9)	108.52(5)	71.47(5)
1353	86.35(6)	93.64(6)	95.52(1)	84.47(1)	108.48(5)	71.51(5)
1373	86.25(8)	93.74(8)	95.83(6)	84.16(6)	108.64(9)	71.36(9)
1393	86.38(8)	93.61(8)	95.59(5)	84.40(5)	108.56(8)	71.43(8)
1413	85.64(4)	94.35(4)	95.63(6)	84.36(6)	108.71(3)	71.28(3)
1433	86.09(7)	93.91(7)	95.84(4)	84.15(4)	109.07(8)	70.93(8)
1453	86.11(1)	93.88(1)	95.64(6)	84.35(6)	108.80(2)	71.20(2)

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25 **Table 4.** O-Fe2-O angles of paramagnetic Fe<sub>2</sub>SiO<sub>4</sub> (numbers in parenthesis are one standard error of the least significant digit).

<i>O-Fe2-O angles (°)</i>							
<i>T (K)</i>	<i>O1-Fe2-O3(1)</i>	<i>O1-Fe2-O3(2)</i>	<i>O2-Fe2-O3(1)</i>	<i>O2-Fe2-O3(2)</i>	<i>O3-Fe2-O3(1)</i>	<i>O3-Fe2-O3(2)</i>	<i>O3-Fe2-O3(2)</i>
<i>Closed-Cycle Refrigerator</i>							
10	80.73(4)	91.39(4)	97.05(4)	90.07(4)	87.57(3)	69.42(4)	114.85(6)
15	80.71(5)	91.33(5)	97.07(5)	90.13(5)	87.54(4)	69.39(7)	114.78(8)
20	80.87(6)	91.52(6)	96.98(5)	89.91(5)	87.61(4)	69.33(7)	115.01(9)
25	80.82(5)	91.47(5)	97.12(5)	89.89(6)	87.60(4)	69.38(7)	115.12(9)
30	80.82(4)	91.59(5)	97.08(5)	89.89(4)	87.63(4)	69.44(7)	114.86(8)
35	80.88(5)	91.46(6)	97.01(5)	89.92(5)	87.58(4)	69.41(8)	114.87(9)
40	80.77(3)	91.49(4)	97.07(3)	89.94(4)	87.60(3)	69.44(4)	115.13(6)
45	80.86(6)	91.50(5)	96.95(5)	89.94(6)	87.57(4)	69.44(7)	114.93(8)
50	80.82(5)	91.51(6)	97.07(4)	89.88(5)	87.56(4)	69.46(7)	114.92(9)
55	80.82(4)	91.55(5)	97.04(5)	89.87(5)	87.58(4)	69.49(7)	115.15(8)
60	80.83(6)	91.54(5)	97.10(5)	89.83(6)	87.61(4)	69.54(7)	115.16(9)
65	80.83(5)	91.61(6)	97.11(5)	89.77(6)	87.63(4)	69.52(7)	115.24(9)
70	80.74(4)	91.49(5)	97.05(4)	89.96(5)	87.56(3)	69.32(7)	114.98(9)
75	80.77(6)	91.45(5)	97.05(6)	89.90(6)	87.61(3)	69.29(7)	114.93(6)
80	80.73(6)	91.51(4)	97.10(6)	89.82(5)	87.62(3)	69.21(7)	114.98(6)
85	80.76(5)	91.44(5)	97.08(5)	89.98(5)	87.57(4)	69.27(7)	115.00(9)
90	80.69(6)	91.54(5)	97.07(5)	89.93(5)	87.60(3)	69.20(7)	115.03(8)
95	80.70(5)	91.61(4)	97.06(6)	89.86(5)	87.61(4)	69.20(7)	115.03(9)
100	80.74(4)	91.49(6)	97.13(6)	89.90(4)	87.60(3)	69.26(4)	114.99(8)
110	80.71(6)	91.50(5)	97.21(6)	89.86(5)	87.59(3)	69.31(7)	114.95(6)
120	80.72(5)	91.56(5)	97.11(4)	89.87(4)	87.62(4)	69.27(7)	114.92(8)
130	80.76(6)	91.47(5)	97.17(5)	89.89(5)	87.62(3)	69.28(7)	114.92(8)

140	80.72(6)	91.43(5)	97.08(6)	90.01(6)	87.56(3)	69.39(7)	114.92(9)
150	80.78(6)	91.45(5)	97.24(6)	89.85(6)	87.54(4)	69.20(7)	115.13(9)
160	80.86(6)	91.48(5)	97.18(6)	89.80(5)	87.62(3)	69.33(7)	114.86(9)
170	80.82(6)	91.40(5)	97.17(4)	89.92(5)	87.62(3)	69.25(7)	114.97(9)
180	80.69(7)	91.43(4)	97.26(6)	89.86(5)	87.56(4)	69.33(7)	114.98(8)
190	80.72(6)	91.36(5)	97.23(6)	89.93(6)	87.58(3)	69.25(7)	114.99(7)
200	80.71(6)	91.55(5)	96.99(6)	89.95(5)	87.52(3)	69.28(7)	115.08(9)
210	80.68(6)	91.38(5)	97.26(6)	89.96(5)	87.52(3)	69.05(7)	115.35(9)
220	80.70(6)	91.49(5)	97.12(6)	89.93(5)	87.56(3)	69.18(7)	115.10(9)
230	80.79(6)	91.38(5)	97.24(6)	89.91(5)	87.52(5)	69.13(4)	115.26(9)
240	80.77(6)	91.49(5)	97.23(6)	89.82(6)	87.52(5)	69.32(7)	115.05(9)
250	80.83(6)	91.44(5)	97.17(6)	89.87(5)	87.59(3)	69.23(7)	115.03(9)
260	80.79(5)	91.28(4)	97.36(7)	89.93(4)	87.55(3)	69.32(7)	115.02(9)
270	80.70(6)	91.43(5)	97.28(6)	89.89(5)	87.51(3)	69.22(7)	115.16(9)
280	80.71(6)	91.45(6)	97.30(6)	89.85(7)	87.57(3)	69.12(7)	115.16(9)
290	80.61(6)	91.55(5)	97.31(6)	89.81(5)	87.57(3)	69.21(7)	115.06(9)
300	80.68(6)	91.45(5)	97.23(6)	89.91(7)	87.59(3)	69.11(6)	115.14(9)
310	80.67(6)	91.44(5)	97.25(6)	89.97(7)	87.54(6)	69.15(8)	115.18(9)
320	80.75(7)	91.44(5)	97.16(7)	89.91(8)	87.56(5)	68.96(7)	115.32(9)
330	80.72(7)	91.39(7)	97.31(5)	89.90(9)	87.48(3)	69.01(8)	115.47(9)
340	80.69(8)	91.23(8)	97.36(7)	90.04(9)	87.54(3)	69.20(9)	115.13(9)

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*TZM furnace*

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297	80.57(9)	91.49(5)	97.11(3)	90.015(10)	87.57(5)	69.30(3)	115.10(3)
373	80.52(1)	91.43(5)	97.10(2)	90.11(4)	87.45(2)	69.29(1)	115.23(7)
393	80.63(8)	91.40(3)	97.18(1)	90.02(5)	87.59(6)	69.40(7)	114.96(2)
413	80.50(9)	91.38(6)	97.31(4)	90.04(7)	87.48(7)	69.24(1)	115.17(6)

433	80.70(4)	91.23(10)	97.24(2)	90.09(3)	87.47(4)	69.18(3)	115.25(9)
453	80.61(6)	91.41(3)	97.26(5)	89.97(6)	87.59(5)	68.97(9)	115.24(5)
473	80.65(7)	91.41(2)	97.18(3)	89.99(6)	87.53(6)	68.96(7)	115.38(7)
493	80.72(9)	91.37(1)	97.25(5)	89.94(7)	87.54(5)	69.04(9)	115.29(8)
513	80.59(8)	91.32(4)	97.24 (6)	90.08(9)	87.51(6)	68.85(6)	115.50(1)
533	80.68(9)	91.35(5)	97.33(8)	89.93(9)	87.54(8)	68.86(3)	115.46(1)
553	80.67(9)	91.13(6)	97.39(9)	90.12(7)	87.50(8)	68.88(3)	115.45(9)
573	80.64(3)	91.23(2)	97.37(9)	90.05(7)	87.53(9)	68.96(8)	115.32(4)
593	80.54(1)	91.33(5)	97.39(7)	90.00(7)	87.55(8)	68.77(9)	115.49(1)
613	80.52(1)	91.25(9)	97.49(1)	90.03(9)	87.62(9)	68.82(3)	115.27(6)
633	80.62(4)	91.23(9)	97.43(2)	90.03(2)	87.50(9)	68.89(9)	115.46(9)
653	80.65(8)	91.21(8)	97.32(1)	90.10(1)	87.45(9)	68.75(4)	115.70(1)
673	80.48(1)	91.30(7)	97.64(9)	89.91(9)	87.62(9)	68.78(5)	115.32(6)
693	80.54(6)	91.10(8)	97.39(3)	90.23(5)	87.42(9)	68.81(7)	115.66(7)
713	80.54(6)	91.07(9)	97.59(5)	90.13(6)	87.48(9)	69.02(8)	115.30(9)
733	80.47(7)	91.15(2)	97.54(4)	90.14(4)	87.58(2)	68.90(1)	115.24(3)
753	80.52(6)	91.20(4)	97.44(6)	90.11(5)	87.54(3)	68.73(3)	115.51(5)
773	80.41(7)	91.22(2)	97.55(5)	90.09(5)	87.61(1)	68.54(3)	115.55(5)
793	80.52(8)	91.30(3)	97.40(5)	90.03(5)	87.55(3)	68.48(4)	115.78(5)
813	80.50(2)	91.26(7)	97.48(1)	90.04(9)	87.51(5)	68.66(9)	115.67(3)
833	80.59(1)	91.31(6)	97.27(1)	90.06(9)	87.50(5)	68.51(9)	115.85(3)
853	80.52(5)	91.20(9)	97.50(10)	90.07(1)	87.54(7)	68.78(9)	115.46(6)
873	80.69(9)	91.14(9)	97.56(6)	89.98(2)	87.53(3)	68.88(6)	115.41(8)
893	80.39(7)	91.11(9)	97.54(5)	90.22(9)	87.53(8)	68.45(9)	115.76(6)
913	80.62(6)	91.11(9)	97.53(3)	90.07(9)	87.53(8)	68.49(1)	115.77(6)
933	80.53(6)	91.07(2)	97.68(3)	90.08(2)	87.57(7)	68.63(4)	115.52(8)

953	80.34(2)	91.30(4)	97.61(5)	90.01(7)	87.60(8)	68.53(4)	115.58(4)
973	80.51(9)	91.32(6)	97.33(7)	90.06(5)	87.47(9)	68.37(9)	116.04(5)
993	80.43(1)	91.19(8)	97.48(9)	90.15(8)	87.50(1)	68.36(8)	115.96(5)
1013	80.49(3)	91.17(8)	97.51(9)	90.11(8)	87.58(2)	68.31(5)	115.85(2)
1033	80.56(1)	91.38(2)	97.27(2)	89.99(8)	87.56(3)	68.31(5)	115.96(9)
1053	80.54(4)	91.35(1)	97.33(1)	90.01(9)	87.52(4)	68.44(6)	115.89(2)
1073	80.79(7)	90.88(3)	97.67(2)	90.11(1)	87.41(8)	68.77(1)	115.69(6)
1093	80.60(1)	91.16(5)	97.34(7)	90.12(2)	87.58(4)	68.42(2)	115.76(4)
1113	80.70(1)	91.17(5)	97.46(5)	90.02(3)	87.48(5)	68.15(6)	116.26(5)
1133	80.70(5)	91.10(10)	97.75(9)	89.92(6)	87.59(6)	68.28(4)	115.87(1)
1153	80.68(1)	90.97(6)	97.62(6)	90.08(4)	87.53(6)	68.22(9)	116.01(4)
1173	80.87(2)	90.92(8)	97.58(3)	90.09(1)	87.48(8)	68.36(9)	116.00(1)
1193	80.90(8)	90.92(9)	97.47(1)	90.16(5)	87.41(6)	68.62(1)	115.87(1)
1213	80.99(6)	90.81(8)	97.61(7)	90.08(5)	87.41(6)	68.52(4)	115.99(1)
1233	80.95(9)	90.91(2)	97.58(1)	90.02(9)	87.51(9)	68.38(1)	115.93(6)
1253	80.87(8)	91.00(9)	97.21(1)	90.18(8)	87.38(9)	68.00(6)	116.60(5)
1273	80.80(1)	90.85(3)	97.67(1)	90.13(8)	87.47(8)	68.44(7)	115.89(6)
1293	80.86(6)	90.84(9)	97.53(8)	90.19(8)	87.32(2)	68.05(1)	116.61(6)
1313	80.97(5)	90.85(9)	97.80(6)	89.93(8)	87.49(9)	68.52(1)	115.82(7)
1333	81.04(2)	90.76(3)	97.66(1)	90.07(1)	87.33(2)	68.47(9)	116.18(4)
1353	80.71(1)	90.66(4)	97.85(2)	90.24(2)	87.41(4)	68.28(1)	116.12(7)
1373	80.70(6)	90.90(9)	97.62(6)	90.14(6)	87.46(6)	67.75(2)	116.62(9)
1393	80.80(3)	90.87(9)	97.75(3)	90.02(5)	87.60(3)	67.85(3)	116.24(1)
1413	80.47(4)	91.24(5)	97.91(1)	89.78(4)	87.73(7)	68.72(7)	115.14(4)
1433	80.86(6)	91.00(8)	97.77(5)	89.85(3)	87.47(7)	67.74(4)	116.66(1)
1453	80.84(6)	90.98(10)	97.53(4)	90.03(6)	87.38(5)	67.79(8)	116.80(7)

27 **Table 5.** Si-O bond lengths and O-Si-O angles of paramagnetic Fe<sub>2</sub>SiO<sub>4</sub> (numbers in parenthesis are one standard error of  
 28 the least significant digit).

<i>Si-O bonds</i>				<i>O-Si-O angles</i>			
<i>T (K)</i>	<i>Si-O1 Å</i>	<i>Si-O2 Å</i>	<i>Si-O3 Å</i>	<i>O1-Si-O2 °</i>	<i>O1-Si-O3 °</i>	<i>O2-Si-O3 °</i>	<i>O3-Si-O3 °</i>
<i>Closed-Cycle Refrigerator</i>							
10	1.624(4)	1.649(3)	1.642(2)	112.44(1)	115.85(1)	103.22(1)	105.12(5)
15	1.623(3)	1.649(3)	1.645(2)	112.55(7)	115.75(1)	103.30(1)	105.31(6)
20	1.621(3)	1.653(4)	1.640(2)	112.78(6)	115.71(1)	103.32(9)	105.13(5)
25	1.618(3)	1.653(3)	1.642(2)	112.49(6)	115.71(1)	103.21(1)	105.33(6)
30	1.618(3)	1.651(3)	1.646(2)	112.36(6)	115.85(1)	103.24(9)	105.72(6)
35	1.617(3)	1.652(3)	1.642(2)	112.56(1)	115.74(1)	103.17(1)	105.27(5)
40	1.619(2)	1.650(2)	1.641(2)	112.45(7)	115.71(1)	103.22(1)	105.37(5)
45	1.622(3)	1.653(3)	1.643(2)	112.64(6)	115.85(1)	103.43(1)	105.22(6)
50	1.622(3)	1.653(3)	1.647(2)	112.47(6)	115.84(1)	103.26(1)	105.37(6)
55	1.617(3)	1.654(4)	1.645(2)	112.47(6)	115.72(1)	103.25(1)	105.34(6)
60	1.623(3)	1.652(3)	1.642(2)	112.52(7)	115.66(1)	103.25(1)	105.31(6)
65	1.623(3)	1.653(3)	1.645(2)	112.44(7)	115.73(1)	103.31(1)	105.48(6)
70	1.623(3)	1.654(3)	1.639(2)	112.19(1)	115.78(1)	103.09(1)	105.39(1)
75	1.627(3)	1.651(3)	1.642(2)	112.61(6)	115.58(1)	103.25(1)	105.08(5)
80	1.615(3)	1.656(3)	1.644(2)	112.54(7)	115.90(1)	102.92(1)	105.03(6)
85	1.622(3)	1.653(3)	1.644(2)	112.53(7)	115.83(1)	103.13(1)	104.81(5)
90	1.622(3)	1.654(3)	1.642(2)	112.51(7)	115.79(1)	103.10(1)	104.98(6)
100	1.627(4)	1.652(3)	1.643(2)	112.54(7)	115.71(1)	103.15(1)	105.06(6)
110	1.623(2)	1.654(2)	1.639(1)	112.18(8)	115.77(5)	103.10(5)	105.38(8)
120	1.620(4)	1.649(3)	1.644(2)	112.47(7)	115.85(1)	103.12(1)	104.85(6)
130	1.627(4)	1.655(3)	1.642(2)	112.53(7)	115.65(1)	103.14(1)	105.20(6)
140	1.619(3)	1.657(3)	1.645(2)	112.46(6)	115.82(1)	102.93(9)	105.28(5)
150	1.626(9)	1.654(9)	1.641(9)	112.35(6)	115.69(1)	103.25(9)	105.11(4)
160	1.624(3)	1.650(3)	1.637(2)	112.14(6)	115.71(1)	103.17(9)	105.45(5)
170	1.623(4)	1.650(3)	1.643(2)	112.62(8)	115.59(1)	103.33(1)	104.90(6)
180	1.621(3)	1.654(3)	1.644(2)	112.69(7)	115.61(1)	103.16(1)	105.09(6)
190	1.625(3)	1.658(3)	1.636(2)	112.00(6)	115.76(1)	103.05(9)	105.69(5)
200	1.621(3)	1.653(3)	1.643(2)	112.21(7)	115.81(1)	103.19(1)	105.10(6)
210	1.625(4)	1.658(3)	1.641(2)	112.36(7)	115.68(1)	103.21(2)	105.19(6)
220	1.619(4)	1.650(3)	1.645(2)	112.80(8)	115.66(1)	103.09(2)	104.99(7)
230	1.625(4)	1.650(3)	1.643(2)	112.66(8)	115.72(1)	103.17(1)	104.85(6)
240	1.620(4)	1.652(3)	1.645(2)	112.55(7)	115.61(1)	103.08(2)	105.38(7)
250	1.617(4)	1.651(3)	1.645(2)	112.69(8)	115.85(1)	102.86(1)	105.09(6)

260	1.618(4)	1.649(3)	1.647(2)	112.85(7)	115.58(1)	103.12(1)	105.06(6)
270	1.620(3)	1.651(3)	1.643(2)	112.41(7)	115.74(1)	103.20(1)	105.02(6)
280	1.625(4)	1.654(3)	1.640(2)	112.41(8)	115.56(1)	103.21(2)	105.42(6)
290	1.621(4)	1.652(3)	1.643(2)	112.60(8)	115.74(1)	102.94(1)	105.31(6)
300	1.616(4)	1.649(3)	1.646(2)	112.71(8)	115.86(1)	102.83(2)	105.11(6)
310	1.621(2)	1.653(2)	1.644(1)	112.59(1)	115.72(6)	103.02(7)	105.20(9)
320	1.619(4)	1.656(4)	1.642(2)	112.71(9)	115.76(2)	102.85(3)	105.32(8)
330	1.617(4)	1.652(3)	1.642(2)	112.47(7)	115.67(1)	103.15(1)	105.23(6)
340	1.621(4)	1.650(3)	1.645(2)	112.56(8)	115.79(1)	103.04(2)	105.04(7)
TMZ Furnace				TMZ Furnace			
297	1.631(4)	1.655(3)	1.641(2)	112.37(8)	115.49(1)	103.23(1)	105.58(7)
373	1.635(3)	1.656(3)	1.641(2)	112.22(6)	115.44(1)	103.31(1)	105.69(5)
393	1.626(4)	1.657(4)	1.644(3)	112.62(3)	115.66(3)	102.92(4)	105.50(1)
413	1.637(5)	1.653(4)	1.640(3)	112.32(3)	115.31(4)	103.38(5)	105.75(2)
433	1.625(4)	1.655(4)	1.639(3)	112.67(2)	115.62(3)	103.01(4)	105.37(9)
453	1.625(4)	1.668(4)	1.633(3)	112.13(3)	115.77(4)	102.92(4)	105.76(1)
473	1.635(4)	1.648(4)	1.635(3)	112.78(2)	115.07(4)	103.46(4)	105.64(1)
493	1.631(4)	1.642(4)	1.639(3)	113.23(1)	115.18(4)	103.32(4)	105.20(9)
513	1.627(4)	1.659(4)	1.635(3)	112.64(3)	115.37(4)	103.23(4)	105.56(1)
533	1.634(4)	1.656(4)	1.631(3)	112.26(3)	115.29(4)	103.51(5)	105.63(2)
553	1.629(4)	1.658(4)	1.633(3)	112.47(3)	115.36(4)	103.36(4)	105.51(1)
573	1.630(2)	1.659(3)	1.634(2)	112.49(4)	115.41(8)	103.17(8)	105.75(3)
593	1.631(4)	1.660(4)	1.632(3)	112.41(3)	115.42(4)	103.19(4)	105.77(1)
613	1.629(4)	1.655(4)	1.634(3)	112.75(3)	115.35(4)	103.13(5)	105.68(2)
633	1.628(4)	1.663(5)	1.632(3)	112.16(4)	115.48(4)	103.03(5)	106.19(2)
653	1.629(4)	1.654(5)	1.636(3)	113.07(4)	115.00(5)	103.33(5)	105.76(2)
673	1.636(4)	1.659(5)	1.629(3)	112.00(3)	115.46(4)	103.17(5)	106.15(2)
693	1.641(4)	1.659(4)	1.632(3)	112.32(2)	115.14(5)	103.54(5)	105.83(1)
713	1.636(4)	1.656(4)	1.636(3)	112.38(2)	115.34(4)	103.22(5)	105.92(1)
733	1.633(5)	1.663(5)	1.635(3)	112.61(5)	115.39(5)	102.97(6)	106.02(3)
753	1.634(5)	1.663(5)	1.631(3)	112.48(4)	115.16(5)	103.14(6)	106.36(3)
773	1.636(5)	1.659(5)	1.629(3)	112.70(4)	115.45(5)	102.98(6)	105.76(3)
793	1.640(5)	1.658(5)	1.627(3)	112.35(5)	115.06(5)	103.36(6)	106.33(3)
813	1.634(5)	1.657(5)	1.633(3)	112.44(5)	115.25(6)	103.17(7)	106.16(4)
833	1.637(5)	1.662(5)	1.630(3)	112.36(5)	114.82(6)	103.54(6)	106.51(3)
853	1.637(5)	1.653(5)	1.636(3)	112.88(6)	115.19(6)	103.16(7)	105.85(4)
873	1.630(3)	1.654(3)	1.636(2)	112.71(5)	115.26(9)	103.00(9)	106.16(4)
893	1.634(5)	1.660(5)	1.632(3)	112.78(6)	115.11(6)	103.21(6)	106.04(5)



913	1.625(5)	1.657(5)	1.633(3)	112.68(7)	115.27(6)	103.16(6)	105.89(5)
933	1.636(5)	1.660(5)	1.630(3)	112.41(6)	115.29(7)	103.11(7)	106.21(5)
953	1.655(5)	1.656(5)	1.625(3)	112.02(4)	114.97(6)	103.44(7)	106.73(4)
973	1.634(5)	1.663(5)	1.631(3)	112.48(7)	115.27(7)	103.07(8)	106.25(6)
993	1.634(5)	1.656(5)	1.633(3)	112.67(7)	115.07(7)	103.28(8)	106.12(6)
1013	1.632(5)	1.668(5)	1.628(3)	112.65(8)	115.21(7)	102.88(8)	106.57(6)
1033	1.635(5)	1.665(6)	1.629(3)	112.78(8)	115.06(8)	102.95(7)	106.63(7)
1053	1.637(5)	1.660(5)	1.634(3)	112.93(7)	115.07(7)	103.06(8)	106.25(6)
1073	1.626(6)	1.653(5)	1.641(3)	113.05(6)	115.33(8)	103.01(8)	105.61(4)
1093	1.641(6)	1.663(6)	1.631(3)	112.95(8)	115.10(8)	103.16(9)	105.98(7)
1113	1.624(6)	1.663(6)	1.632(3)	112.66(9)	115.33(8)	103.14(9)	105.81(8)
1133	1.634(6)	1.650(6)	1.630(4)	113.20(9)	115.19(8)	103.01(9)	105.80(8)
1153	1.628(5)	1.666(6)	1.629(3)	112.85(8)	115.28(8)	102.92(8)	106.12(7)
1173	1.628(3)	1.663(3)	1.632(2)	113.13(7)	115.14(1)	103.04(1)	105.92(6)
1193	1.633(6)	1.671(6)	1.634(4)	113.08(9)	115.02(9)	102.93(9)	106.47(8)
1213	1.628(6)	1.668(6)	1.631(4)	112.68(9)	115.17(8)	102.97(9)	106.46(7)
1233	1.627(6)	1.666(6)	1.632(4)	113.37(9)	115.16(9)	102.82(9)	106.02(8)
1253	1.623(6)	1.663(6)	1.633(4)	113.55(9)	115.02(9)	103.07(1)	105.68(8)
1273	1.632(6)	1.667(6)	1.633(4)	113.03(9)	115.31(9)	102.83(1)	106.02(9)
1293	1.630(5)	1.666(5)	1.630(3)	112.83(7)	114.93(7)	103.34(8)	106.15(6)
1313	1.628(5)	1.663(5)	1.635(3)	112.98(7)	115.14(6)	102.99(6)	106.17(5)
1333	1.642(5)	1.648(5)	1.636(3)	113.47(7)	114.50(7)	103.64(7)	105.87(6)
1353	1.624(6)	1.665(6)	1.635(3)	112.86(9)	115.34(8)	102.87(9)	106.07(7)
1373	1.629(6)	1.665(6)	1.628(3)	113.23(9)	115.28(9)	103.03(9)	105.51(8)
1393	1.616(6)	1.673(6)	1.629(3)	113.56(9)	115.36(8)	102.54(9)	105.88(7)
1413	1.643(6)	1.655(5)	1.636(4)	112.50(9)	116.04(7)	102.13(9)	106.21(9)
1433	1.635(6)	1.640(5)	1.630(3)	113.79(7)	114.81(9)	103.41(9)	105.25(5)
1453	1.630(3)	1.659(3)	1.630(2)	113.42(5)	114.97(9)	103.09(1)	105.88(4)