Griffiths et al. 2015 *American Mineralogist* **Supplementary tables**

TABLE S1. Frequencies of different phases and COR groups separately in each garnet domain

Phase	Group	N in garnet domain 1	N in garnet domain 2	Relative frequency (within each phase) %	Relative frequency (within each phase) %
Rutile	All inclusions	108	142	-	-
	R1	10	33	9	23
	R2	1	3	1	2
	R3	44	61	41	43
	R1*	46	36	43	25
Corundum	All inclusions	99	81	-	-
	C1	23	46	23	57
	C2	34	22	34	27
	C3	3	0	3	0
	C4	20	7	20	9

Notes: Relative frequencies do not sum to 100% for either phase as some inclusions do not belong to any group

TABLE S2. Classification of the CORs of the (sub)groups detailed in tables 1-3.

(Sub)group	COR type	major statistical COR character	minor statistical COR character
R1a	statistical	dispersion	-
R1*	statistical	dispersion	too few data points
R2a	specific	-	
R3a	statistical	rotation	dispersion
R3b	statistical	too few data points	
C1a	specific	-	
C2a	specific	-	
C3	statistical	too few data points	
C4	statistical	rotation	dispersion
I1a	specific	-	
I2a	specific	-	
I3	statistical	rotation	dispersion

Notes: In some cases, CORs are clearly not specific but insufficient measurements exist to decide on their character, these receive the description 'too few data points'. Subgroups not included in tables 1-3 or this table also fall into this category.

TABLE S3. Lattice constants used for calculation of lattice strains at room temperature and 600°C.

Phase	T = 25°C		T = 600°C		Cell dimension reference
	a (Å)	c (Å)	a (Å)	c (Å)	
Almandine-spessartine (X_{Fe} 0.5 X_{Mn} 0.5)	11.57 [a]	-	11.62 [a,b]	-	Geiger 1999
Rutile	4.59	2.96	4.62	2.98	Meagher and Lager 1979
Corundum	4.76	12.99	4.78 [c]	13.05 [c]	Fiquet et al. 1999
Ilmenite	5.09	14.09	5.12	14.19	Wechsler and Prewitt 1984

Notes: [a] Lattice parameters for a garnet of the stated composition were calculated by linear interpolation from the values for the almandine and spessartine end members, obtained from Geiger (1999).
[b] High temperature cell parameters for both garnet end members were calculated using the thermal expansion coefficients and equation of Geiger (1999). [c] Lattice parameters for corundum are for T = 611ºC
References:

Fiquet, G., Richet, P., and Montagnac, G. (1999) High-temperature thermal expansion of lime, periclase, corundum and spinel. Physics and Chemistry of Minerals, 27, 103–111.
Geiger, C.A. (1999) Thermodynamics of (Fe2+, Mn2+, Mg, Ca)3− Al2Si3O12 garnet: a review and analysis. Mineralogy and Petrology, 66, 271–299.
Meagher, E.P., and Lager, G.A. (1979) Polyhedral thermal expansion in the TiO2 polymorphs: refinement of the crystal structures of rutile and brookite at high temperature. Canadian Mineralogist, 17, 77–85.
Wechsler, B.A., and Prewitt, C.T. (1984) Crystal structure of ilmenite (FeTiO 3) at high temperature and at high pressure. American Mineralogist, 69, 176–185.

TABLE S4. Calculation of lattice strains at 600°C for parallel sets of rutile and garnet planes determined using EBSD.

(Sub)group	CORs from EBSD (format: rt ‖ grt)	Lowest index planes (-0.04 ≤ ε ≤ 0.04) (format: rt ‖ grt)	ε	Best fit 1 : x d-spacing ratio (format: rt ‖ grt)	ε (1 : x d-spacing ratio)
R1a	{001} ‖ {110}	{003} ‖ {880}	0.03	{001} ‖ {330}	-0.09
	{100} ‖ {112} *(1ax)*	**{100} ‖ {112}**	**0.03**	-	-
R1a / R1*	**{100} ‖ {111} *(1ax)***	**{200} ‖ {333}**	**-0.03**	-	-
R2a	{001} ‖ {111}	{003} ‖ {777}	-0.04	{001} ‖ {222}	0.11
	{100} ‖ {112} *(1ax)*	**{100} ‖ {112}**	**0.03**	-	-
	{100} ‖ {110} *(1ax)*	{004} ‖ {777}	0.02	{100} ‖ {220}	-0.12
R3a	**<103> ‖ <111>**	**<206> ‖ <111>**	**0.00**	-	-
	{405} ‖ {111}	{405} ‖ {13 13 13}	-0.03	{405} ‖ {12 12 12}	0.05
R3b	{001} ‖ {113}	{005} ‖ {6 6 18}	-0.02	{001} ‖ {113}	0.15
	{100} ‖ {112} *(1ax)*	**{100} ‖ {112}**	**0.03**	-	-
	{101} ‖ {110}	{303} ‖ {10 10 0}	-0.02	{101} ‖ {330}	0.09

Notes: rt = rutile; grt = garnet; ε = calculated lattice strain. Lattice strains given to 2 decimal places, at this degree of precision errors in lattice constants used for the calculation are too small to affect the result. Bolded relationships are those where the target lattice strain can be achieved with a simple 1:x or 2:x d-spacing ratio.

TABLE S5. Calculation of lattice strains at 600°C for parallel sets of corundum and garnet planes determined using EBSD.

(Sub)group	CORs from EBSD (format: crn ‖ grt)	Lowest index planes (-0.04 ≤ ε ≤ 0.04) (format: crn ‖ grt)	ε	Best fit 1 : x d-spacing ratio (format: crn ‖ grt)	ε (1 : x d-spacing ratio)
C1a	{0001} ‖ {112}	{0008} ‖ {336}	-0.03	{0003} ‖ {112}	0.08
	{11-20} ‖ {111} *(1ax)*	{4 4 -8 0} ‖ {11 11 11}	0.02	{11-20} ‖ {333}	-0.07
	{10-10} ‖ {110} *(1ax)*	**{10-10} ‖ {220}**	**-0.01**	-	-
C2a	**{0001} ‖ {111}**	**{0002} ‖ {111}**	**0.03**	-	-
	{11-20} ‖ {112}	**{11-20} ‖ {224}**	**-0.01**	-	-
	{10-10} ‖ {110}	**{10-10} ‖ {220}**	**-0.01**	-	-
C3	{0001} ‖ {001}	{0007} ‖ {006}	0.04	{0001} ‖ {001}	-0.12
	{11-20} ‖ {110} *(1ax)*	{22-40} ‖ {770}	-0.02	{11-20} ‖ {330}	0.13
	{10-10} ‖ {110} *(1ax)*	**{10-10} ‖ {220}**	**-0.01**	-	-
C4	{11-20} ‖ {111} *(1ax)*	{4 4 -8 0} ‖ {11 11 11}	0.02	{11-20} ‖ {333}	-0.07

Notes: crn = corundum; grt = garnet; ε = calculated lattice strain. Lattice strains given to 2 decimal places, at this degree of precision errors in lattice constants used for the calculation are too small to affect the result. Bolded relationships are those where the target lattice strain can be achieved with a simple 1:x or 2:x d-spacing ratio.

TABLE S6. Calculation of lattice strains at 600°C for parallel sets of ilmenite and garnet planes determined using EBSD.

(Sub)group	CORs from EBSD (format: ilm ‖ grt)	Lowest index planes (-0.04 ≤ ε ≤ 0.04) (format: ilm ‖ grt)	ε	Best fit 1 : x d-spacing ratio (format: ilm ‖ grt)	ε (1 : x d-spacing ratio)
I1a	**{0001} ‖ {112}**	**{0003} ‖ {112}**	**0.01**	-	-
	{11-20} ‖ {111} *(1ax)*	{33-60} ‖ {888}	-0.02	{11-20} ‖ {333}	-0.14
	{10-10} ‖ {110} *(1ax)*	{50-50} ‖ {990}	-0.01	{10-10} ‖ {220}	-0.08
I2a	{0001} ‖ {111}	{0 0 0 13} ‖ {6 6 6}	0.03	{0002} ‖ {111}	-0.06
	{11-20} ‖ {112}	{5 5 -10 0} ‖ {9 9 18}	0.03	{11-20} ‖ {224}	-0.08
	{10-10} ‖ {110}	{50-50} ‖ {990}	-0.01	{10-10} ‖ {220}	-0.08
I3	{11-20} ‖ {111}	{33-60} ‖ {888}	-0.02	{11-20} ‖ {333}	-0.14

Notes: ilm = ilmenite; grt = garnet; ε = calculated lattice strain. Lattice strains given to 2 decimal places, at this degree of precision errors in lattice constants used for the calculation are too small to affect the result. Bolded relationships are those where the target lattice strain can be achieved with a simple 1:x or 2:x d-spacing ratio.