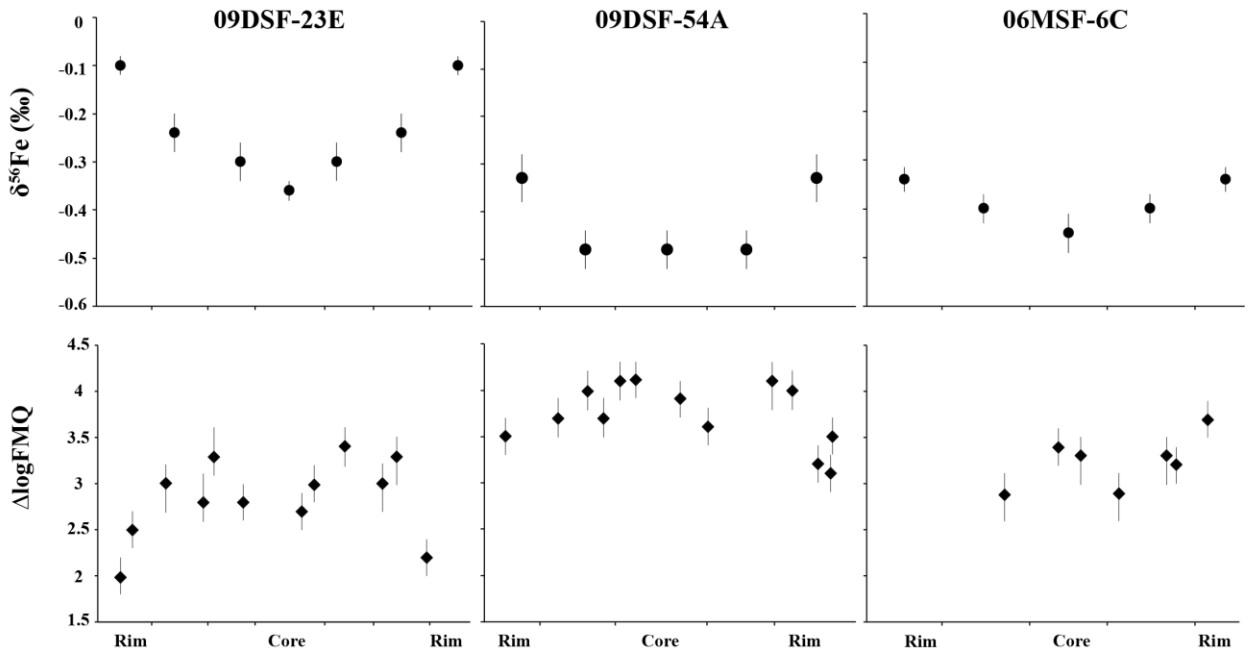
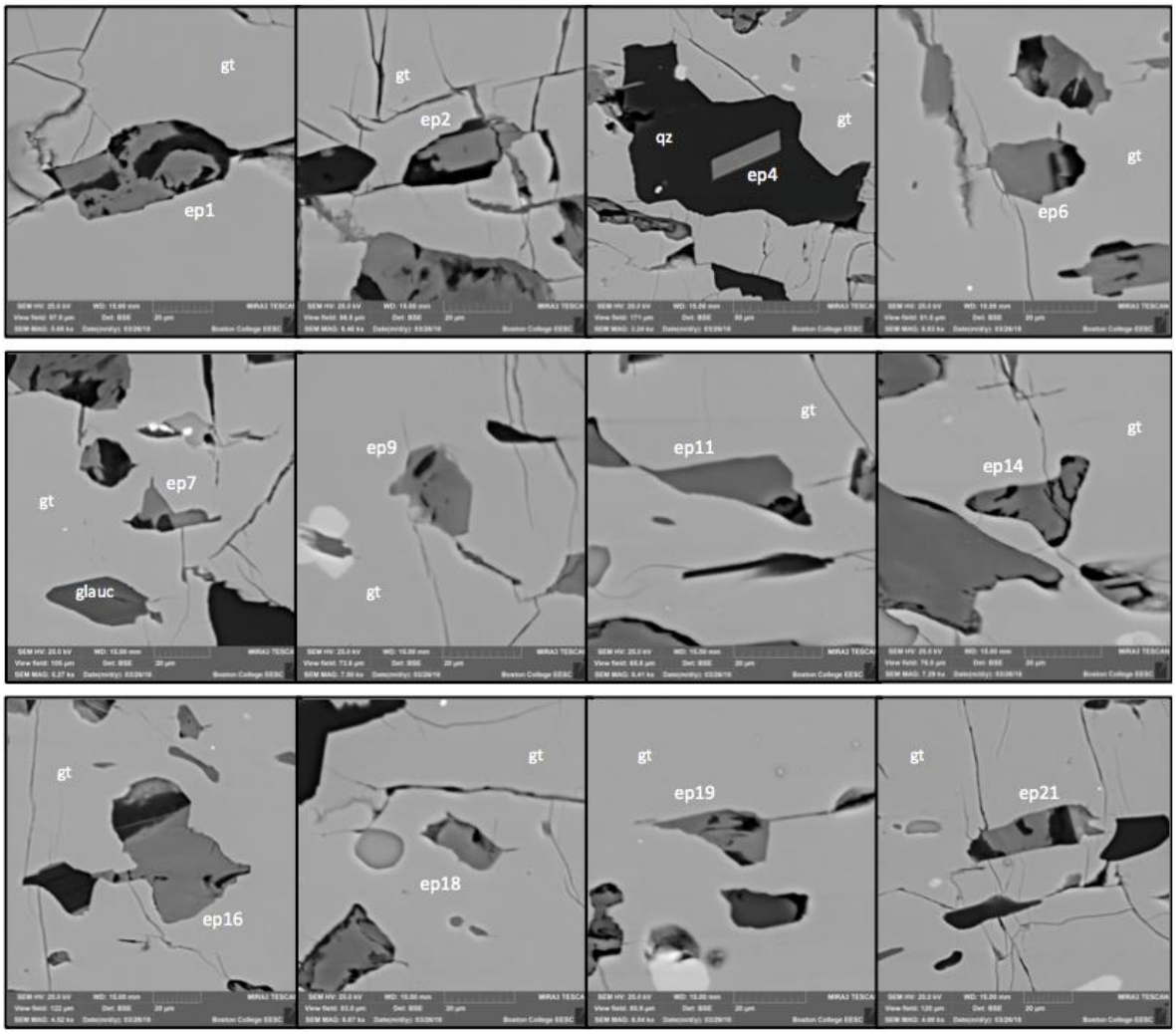
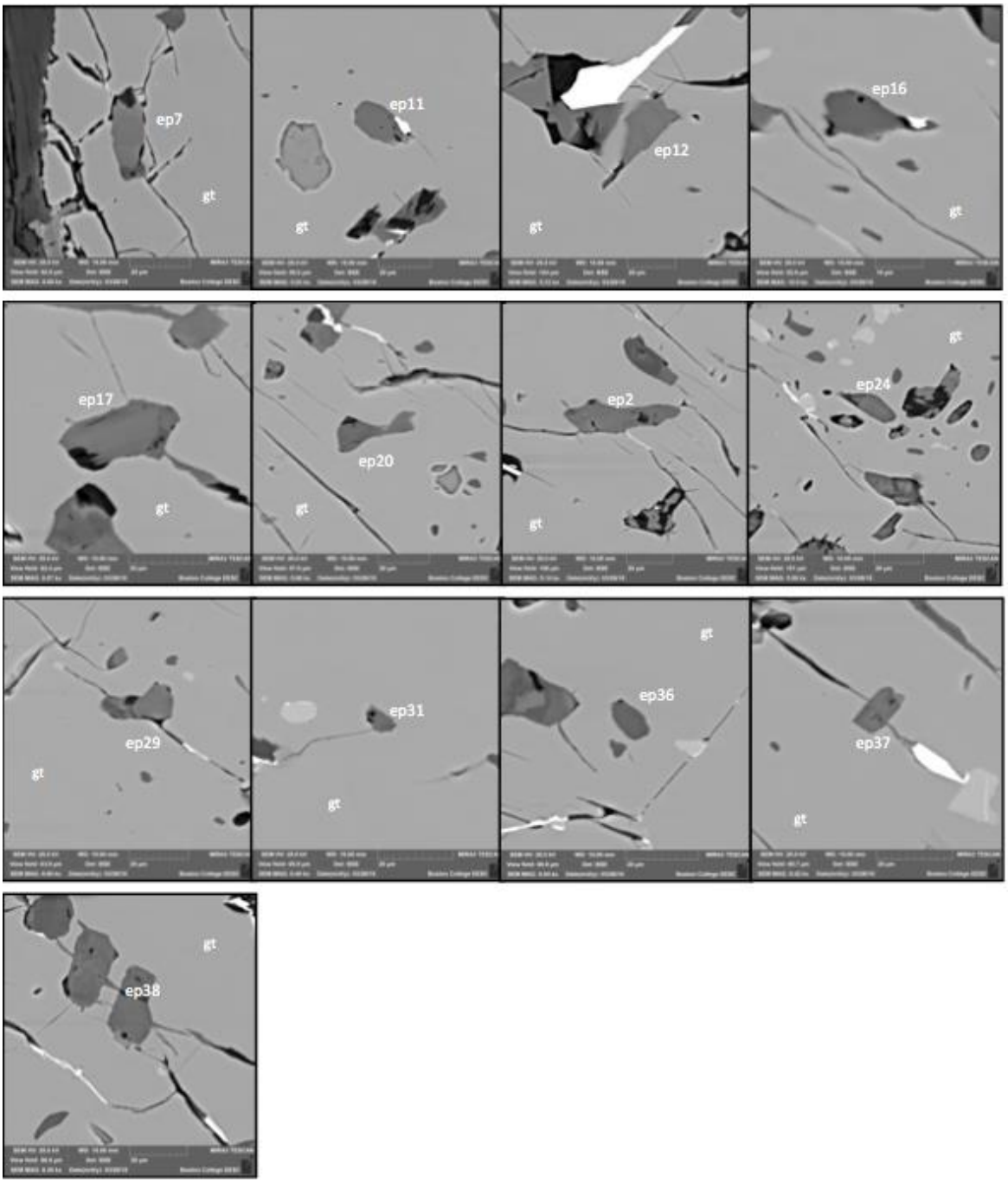


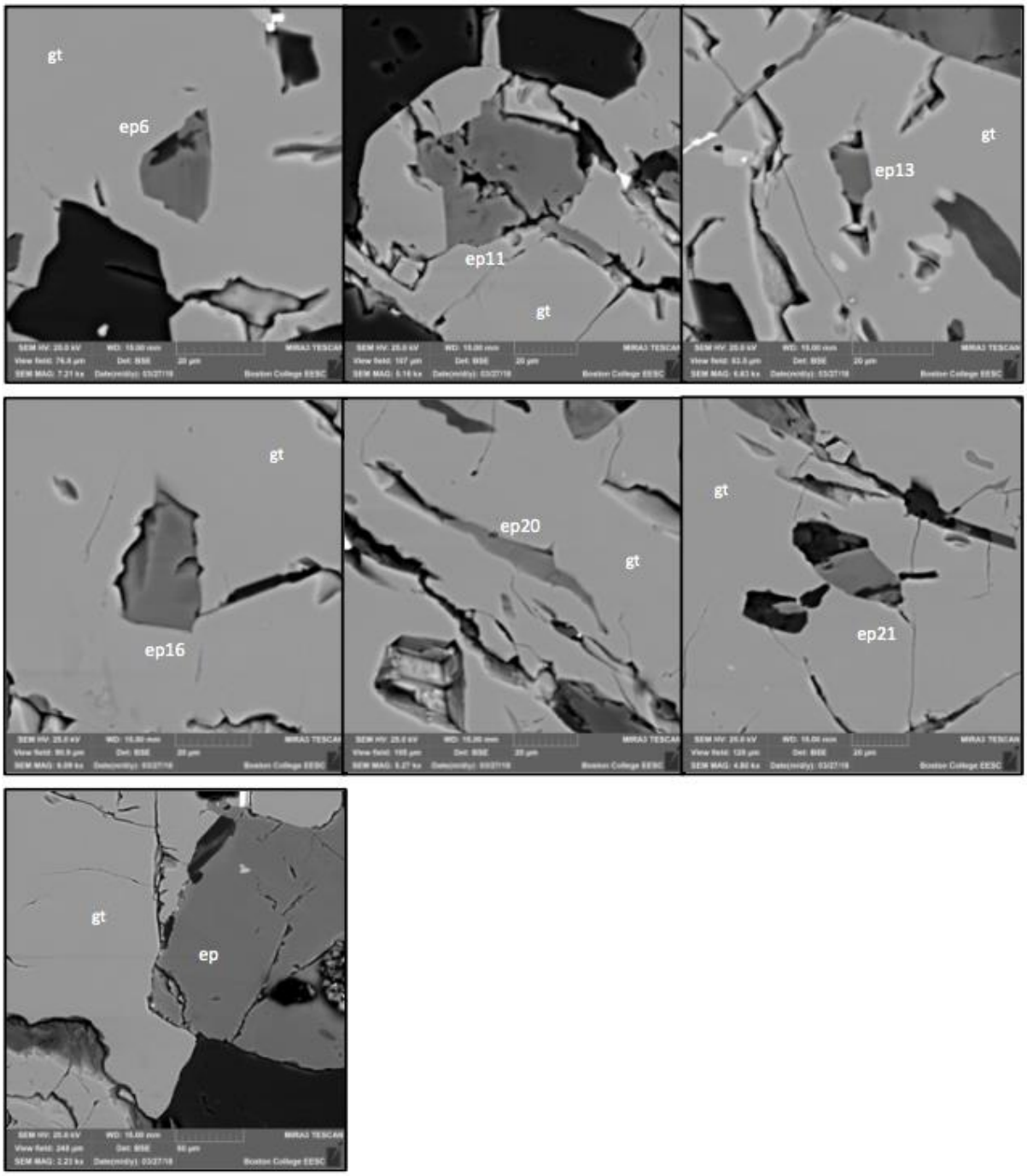
Supplementary Figure 1: ΔlogFMQ and the δ^{56}Fe values plotted from rim-core-rim in one garnet grain from samples 09DSF-54A, 09DSF-23E, 06MSF-6C. Error calculations for the δ^{56}Fe data are the two-standard deviation of four isotopic analysis for each sample. Errors for the ΔlogFMQ values are ±0.2 log units for the core and rim points, calculated using the ±1kbar and ±40°C errors associated with *P-T* estimates from thermodynamic modeling[30]. The errors for the ΔlogFMQ of the intermediate zones are calculated accounting for the slightly larger uncertainty in the P-T conditions and were calculated using upper and lower bounds for the possible P-T conditions (see further discussion in methods section and calculations in Supplementary Table 5).



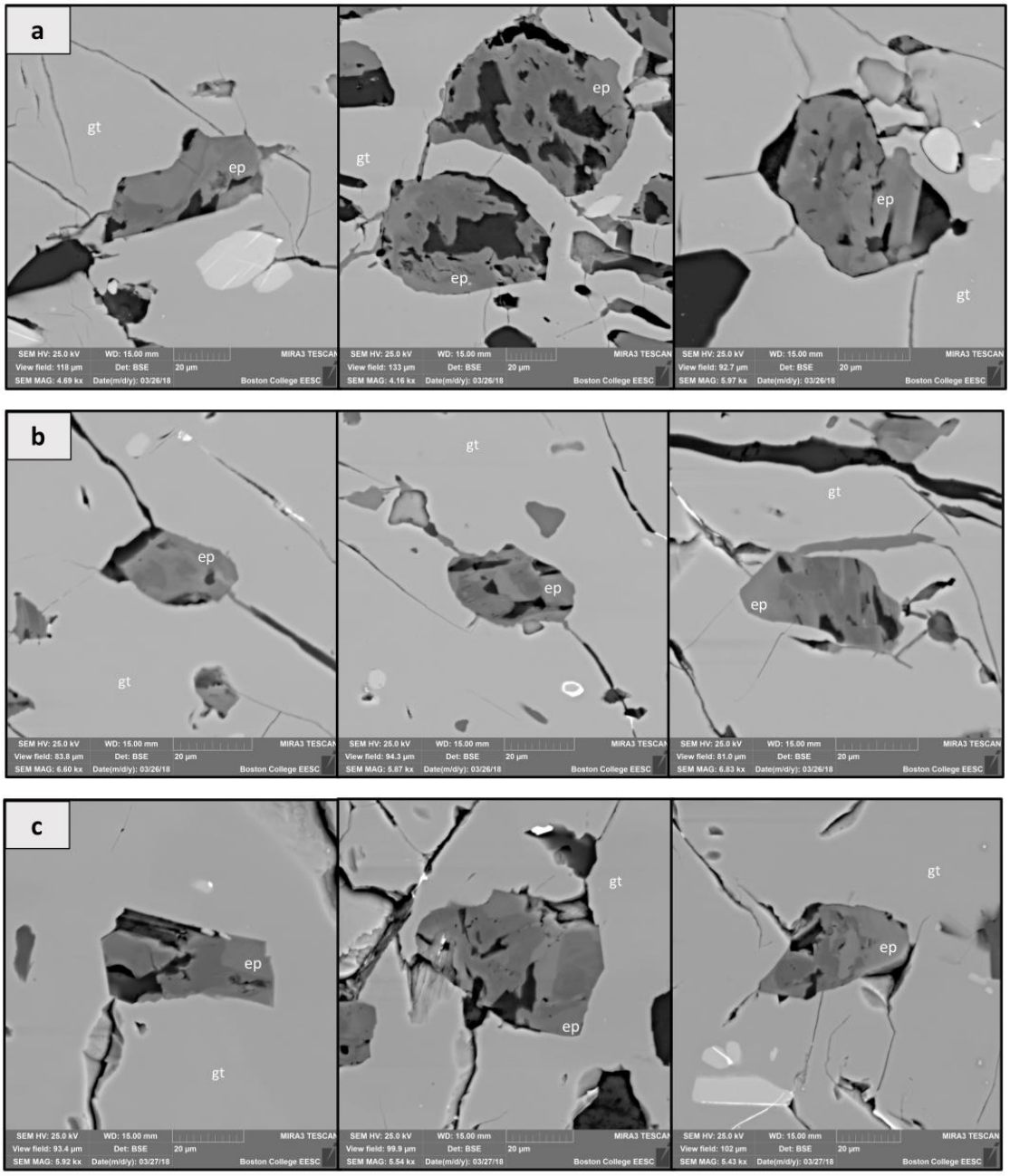
Supplementary Figure 2: BSE images of each epidote inclusion in sample 09DSF-23E used in oxygen barometry calculations.



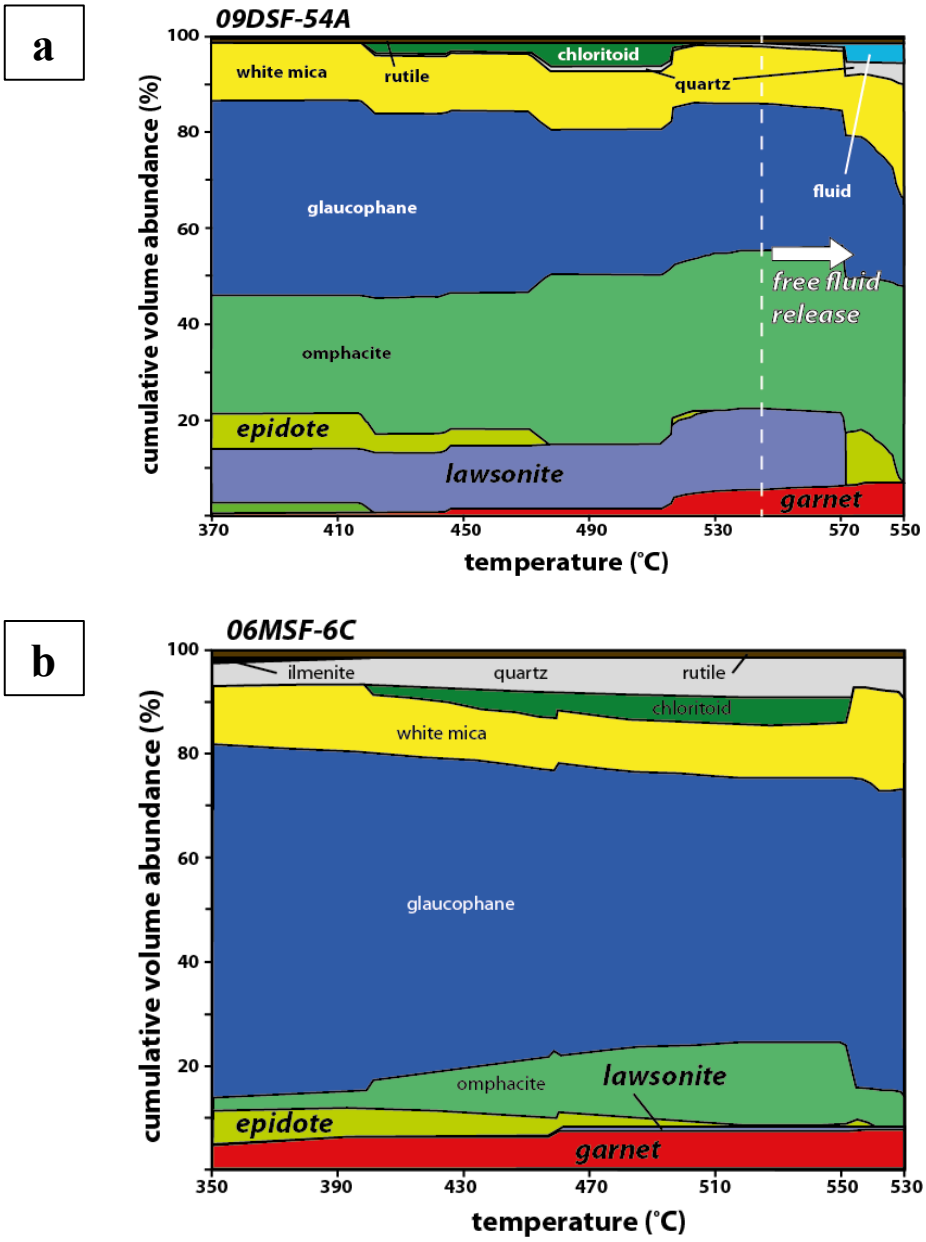
Supplementary Figure 3: BSE images of each epidote inclusion in sample 09DSF-54A used in oxygen barometry calculations.



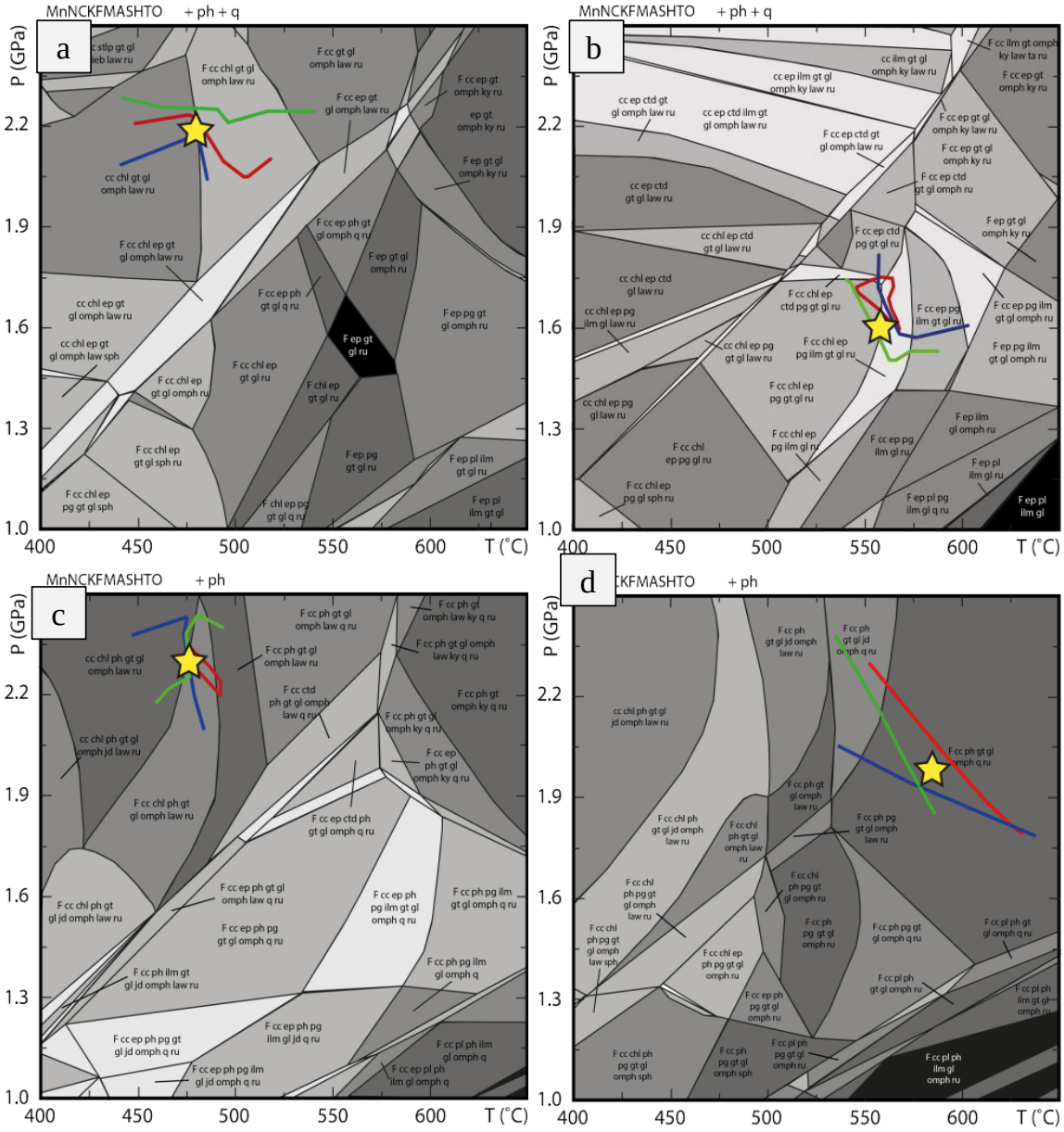
Supplementary Figure 4: BSE images of each epidote inclusion in sample 06MSF-6C used in oxygen barometry calculations.



Supplementary Figure 5: BSE images of epidote inclusion in samples A) 09DSF-23E, B) 09DSF-54A, and C) 06MSF-6C so show epidote inclusions thought to be pseudomorphs after lawsonite. Epidote inclusions such as these display chemical zoning and are associated with albite or paragonite, products of lawsonite breakdown. As a result, these and all similar epidote inclusions were not used in oxygen barometry calculations. Abbreviations used include gt = garnet and ep = epidote.



Supplementary Figure 6: Mineral volume abundance (in %) for a straight line *P-T* path from core to rim as given in Supplementary Figure 7. a) Plot for sample 09DSF-54A shows garnet growth spans lawsonite breakdown. The onset of lawsonite breakdown releases a free fluid phase, shown as the light blue field and marked by the white dashed line at ~540C. b) Sample 06MSF-6C shows that garnet growth does not span the breakdown of any hydrous mineral phases.



Supplementary Figure 7: Equilibrium phase diagram sections used for calculation of core and rim *P-T* conditions for samples 09DSF-23E and 09DSF-54A. Phase diagrams (A) and (C) use whole rock bulk compositions for calculation of *P-T* conditions corresponding to core growth for samples 09DSF-23E and 09DSF-54A respectively. Phase diagrams (B) and (D) were calculated using matrix bulk compositions to estimate the *P-T* conditions for growth of the garnet rims (Supplementary Table 3) for samples 09DSF-23E and 09DSF-54A respectively. Garnet chemical isopleths corresponding to observed garnet core and rim chemistry (Supplementary Table 4) are plotted (almandine=red, grossular=green, spessartine=blue). Intersection of garnet core isopleths constrains the *P-T* of garnet nucleation and intersection of garnet rim isopleths constrains the *P-T* of garnet rim growth. Mineral assemblages are labeled using the following abbreviations: gt = garnet; ep = epidote; law = lawsonite; chl = chlorite; ph = phengite; omph = omphacite; q = quartz; ru = rutile; jd = jadeite; gl = glaucophane; ilm = ilmenite; pl = plagioclase; cc = carbonate; F = fluid; sph = sphene; ctd = chloritoid; pg = paragonite; ky = kyanite.

Supplementary Table 1: Reported fO_2, **Δ**logFMQ, and error values for each garnet-epidote inclusion pair for samples 09DSF-23E, 09DSF-54A, and 06MSF-6C with *P-T*s used in calculations. The distance of each epidote inclusion from the core of the garnet also reported. The *P-T* conditions used for garnet core and rim points are derived from thermodynamic modelling (Supplementary Figure 7). The *P-T* conditions for the garnet intermediate zone points were chosen using an estimated P-T path (see methods section) and assuming the intermediate zone grew close to the P-T conditions for the core.

	Epidote Inclusion	Distance from Core (mm)	T (°C)	P (kbar)	fO_2 (log)	FMQ (log)	ΔlogFMQ	fO_2 error
09DSF-23E	Ep 1	-6.16	555	16	-17.6	-19.6	2	0.2
	Ep 2	-5.72	555	16	-17.1	-19.6	2.5	0.2
	Ep 4	-4.41	500	21.6	-18.1	-21.1	3	0.2
	Ep 6	-3.02	490	21.6	-18.7	-21.5	2.8	0.2
	Ep 7	-2.59	490	21.6	-18.2	-21.5	3.3	0.2
	Ep 9	-1.57	480	21.5	-19.1	-21.9	2.8	0.2
	Ep 11	0.63	480	21.5	-19.2	-21.9	2.7	0.2
	Ep 14	1.11	480	21.5	-18.9	-21.9	3	0.2
	Ep 16	2.30	490	21.6	-18.1	-21.5	3.4	0.2
	Ep 18	3.72	500	21.6	-18.1	-21.1	3	0.2
	Ep 19	4.2	500	21.6	-17.8	-21.1	3.3	0.2
	Ep 21	5.32	555	16	-17.4	-19.6	2.2	0.2
09DSF-54A	Ep 7	-4.43	584	20	-14.7	-18.2	3.5	0.2
	Ep 11	-3.01	490	23.1	-17.6	-21.3	3.7	0.2
	Ep 12	-2.22	490	23.1	-17.3	-21.3	4	0.2
	Ep 16	-1.81	490	23.1	-17.6	-21.3	3.7	0.2
	Ep 17	-1.34	490	23.1	-17.2	-21.3	4.1	0.2
	Ep 20	-0.94	475	23	-17.8	-21.9	4.1	0.2
	Ep 2	1.01	475	23	-18.3	-21.9	3.6	0.2
	Ep 24	0.25	475	23	-18	-21.9	3.9	0.2
	Ep 29	2.75	490	23.1	-17.2	-21.3	4.1	0.2
	Ep 31	3.30	490	23.1	-17.3	-21.3	4	0.2
	Ep 36	3.97	584	20	-15	-18.2	3.2	0.2
	Ep 37	4.31	584	20	-15.1	-18.2	3.1	0.2
	Ep 38	4.35	584	20	-14.7	-18.2	3.5	0.2
06MSF-6C	Ep 6	-2.05	490	20.6	-18.7	-21.6	2.9	0.2
	Ep 11	0.25	470	20.2	-19.1	-22.5	3.4	0.2
	Ep 13	1.16	490	20.6	-18.3	-21.6	3.3	0.2
	Ep 16	2.79	490	20.6	-18.7	-21.6	2.9	0.2
	Ep 20	4.78	490	20.6	-18.3	-21.6	3.3	0.2
	Ep 21	5.23	560	22	-15.6	-18.8	3.2	0.2
	Ep rim	6.62	560	22	-15.1	-18.8	3.7	0.2

Supplementary Table 2: Reported $\delta^{56/54}$Fe and $\delta^{57/54}$Fe values of garnet zones from samples 09DSF-23E, 09DSF-54A, and 06MSF-6C using the IRMM-014 external standard with 2sd; n=4 error reported.

Sample	Garnet Zone	$\delta^{56/54}$FeIRMM14 (‰)	2sd (‰)	$\delta^{57/54}$FeIRMM14 (‰)	2sd (‰)
09DSF-23E	**Core**	-0.36	±0.02	-0.48	±0.09
	Zone 2	-0.3	±0.04	-0.44	±0.02
	Zone 3	-0.24	±0.04	-0.37	±0.03
	Rim	-0.1	±0.02	-0.24	±0.16
09DSF-54A	**Core**	-0.48	±0.04	-0.69	±0.04
	Zone 2	-0.48	±0.04	-0.63	±0.11
	Rim	-0.33	±0.05	-0.47	±0.07
06MSF-6C	**Core**	-0.45	±0.04	-0.65	±0.05
	Zone 2	-0.4	±0.03	-0.58	±0.03
	Rim	-0.34	±0.025	-0.48	±0.04

Supplementary Table 3: Major element whole rock bulk chemistry, matrix bulk chemistry, and fluid content used in thermodynamic modeling of samples 09DSF-23E, 09DSF-54A, and 06MSF-6C reported in Supplementary Figure 6 and Supplementary Figure 7. Ferric/ferrous iron was estimated based on mineral mode and chemistry.

wt%	09DSF-23E Whole Rock	09DSF-23E Matrix	09DSF-54A Whole Rock	09DSF-54A Matrix	06MSF-6C Whole Rock
SiO_2	49.53	51.55	51.02	51.68	53.15
TiO_2	1.12	1.2	1.43	1.49	1.07
Al_2O_3	17.51	16.69	14.53	14.3	13.77
FeO	8.35	4.42	6.8	10.18	9.19
Fe_2O_3	3.98	5.18	7.55	2.83	4.15
MnO	0.16	0.02	0.11	0.07	0.14
MgO	4.95	0.11	4.43	4.56	5.65
CaO	8.59	8.06	5.89	6.18	2.42
Na_2O	2.78	3.02	5.72	5.96	5.3
K_2O	1.05	0.86	1.25	1.3	0.99
Total	98.02	91.11	98.73	98.55	95.83
$Fe^{3+}/\Sigma Fe$	0.3	0.3	0.5	0.5	0.2
Fluid content (wt% H_20)	6.0	3.0	4.0	2.7	2

Supplementary Table 4: Garnet and epidote major element chemistry for samples 09DSF-23E, 09DSF-54A, and 06MSF-6C.

Sample	Inclusion	Composition										
		Cr2O3	Al2O3	CaO	MnO	Na2O	TiO2	SiO2	K2O	FeO	MgO	Total
06MSF-6C	Ep 6	0	26.3	23.52	0.2452	0.0513	0.359	37.39	0.003	9.55	0.0318	97.4503
	Ep 11	0.0307	23.95	22.63	0.3904	0.0397	0.0662	37.1	0.0086	12.12	0	96.3357
	Ep 13	0	26.28	23.48	0.3019	0.0172	0.018	37.56	0.0021	9.99	0	97.6492
	Ep 16	0	26.67	23.59	0.3491	0.0343	0.0498	36.97	0.0047	9.77	0	97.438
	Ep 20	0.03	23.41	23.19	0.197	0.0513	0.1187	37.29	0.0077	13.34	0	97.6348
	Ep 21	0	25.19	22.81	0.5854	0	0.0783	37.12	0.005	11.35	0	97.1388
	Ep rim	0.0301	23.36	23.14	0.1777	0.0289	0.0424	37.2	0.0186	12.97	0	96.9677
	Gt by ep 6	0.0563	21.81	7.53	1.0537	0.0257	0.0884	37.27	0.0021	31.54	1.96	101.3361
	Gt by ep 11	0.0622	21.61	6.86	1.81	0.0104	0.1118	37.16	0.0072	32.26	1.79	101.6815
	Gt by ep 13	0.0218	21.74	6.65	1.51	0.07	0.0745	37.53	0.0024	32.3	1.91	101.8086
	Gt by ep 16	0.0422	21.58	7.21	1.1663	0	0.1213	37.39	0.0087	31.4	1.91	100.8284
	Gt by ep 20	0.0236	21.78	7.63	0.8699	0.0026	0.0721	37.44	0.0033	31.23	2.15	101.2014
	Gt by ep 21	0.0413	21.8	8.2	0.8393	0.0511	0.0727	37.46	0	30.78	2.11	101.3543
	Gt by ep rim	0.0229	21.87	7.51	0.6195	0.0563	0.0204	37.44	0.017	31.74	1.83	101.126
09DSF-54A	Ep 7	0	23.33	23.19	0	0.0022	0	38.17	0.0141	13.31	0.0255	98.0418
	Ep 11	0	23.98	22.97	0	0.0198	0	38.2	0	12.65	0.0393	97.8591
	Ep 12	0	21.8	23.3	0	0	0	37.98	0	14.87	0.0103	97.9604
	Ep 16	0	25.34	23.14	0	0	0	38.41	0.0027	11.06	0	97.9528
	Ep 17	0	23.33	22.73	0	0	0	38.33	0.0436	13.32	0.0044	97.7581
	Ep 20	0	22.92	22.89	0	0.0446	0	38.19	0.0177	14.07	0	98.1323
	Ep 2	0	25.13	23.53	0	0	0	38.42	0.0257	10.89	0	97.9958
	Ep 24	0	24.71	23.13	0	0.0454	0	38.37	0	11.14	0	97.3955
	Ep 29	0	23.39	23.03	0	0.0355	0	37.53	0.0012	13.44	0.0614	97.4882
	Ep 31	0	23.47	23.31	0	0.044	0	38.42	0.0035	12.72	0.1204	98.088
	Ep 36	0	26.78	23.85	0	0	0	37.85	0	9.92	0	98.4
	Ep 37	0	27.44	24.09	0	0	0	39.08	0	8.44	0.0927	99.1428
	Ep 38	0	25.18	23.66	0	0.0108	0	38.5	0	11.09	0.0151	98.456
	Gt by ep 7	0.0123	21.79	7.64	0.526	0.0592	0.0435	37.49	0	32.58	1.96	102.101
	Gt by ep 11	0.0116	21.62	7.1	0.5526	0	0.0495	37.21	0.0036	33.72	1.5405	101.8077
	Gt by ep 12	0.0417	21.42	7.1	0.6844	0.0131	0.0894	37.39	0	34.12	1.2953	102.1538
	Gt by ep 16	0.0438	21.48	6.7	1.0004	0.0367	0.1039	37.3	0.0021	34.26	1.1578	102.0846
	Gt by ep 17	0.0255	21.79	6.47	1.49	0.0105	0.0674	37.26	0	34.44	1.0624	102.6157
	Gt by ep 20	0.0316	21.42	6.74	1.77	0.0211	0.0935	37.22	0	34.4	0.9958	102.6919
	Gt by ep 2	0.015	21.34	7.22	1.67	0.0158	0.0882	37.25	0	34.09	0.9861	102.675
	Gt by ep 24	0.05	21.49	6.53	2.18	0.0079	0.0756	37.33	0.0051	33.81	0.9682	102.4467
	Gt by ep 29	0.0027	21.37	6.88	1.89	0.0079	0.0802	37.28	0.0018	34.18	0.99	102.6825
	Gt by ep 31	0.0166	21.25	7.13	1.43	0.0131	0.1156	37.18	0	34.16	1.0137	102.309
	Gt by ep 36	0.0372	21.38	7.07	0.8002	0.0105	0.1179	37.32	0.0036	34.37	1.1517	102.2611
	Gt by ep 37	0.0178	21.29	7.28	0.6685	0.0183	0.0838	37.56	0.0071	34.13	1.2375	102.293
	Gt by ep 38	0.0178	21.29	7.28	0.6685	0.0183	0.0838	37.56	0.0071	34.13	1.2375	102.293
09DSF-23E	Ep 1	0	27.95	23.9	0.1957	0	0.2066	38.03	0	8.26	0.0142	98.5565
	Ep 2	0	26.39	23.78	0.1804	0	0.0318	37.39	0	9.79	0.0227	97.5849
	Ep 4	0	26.41	23.26	0.0359	0	0.0619	37.61	0	9.88	0.0297	97.2876
	Ep 6	0	26.15	23.44	0.2899	0	0.0522	36.95	0	10.34	0.0097	97.2318
	Ep 7	0	25.19	23.57	0.1691	0	0.0036	37.05	0.0006	11.47	0.0059	97.4593
	Ep 9	0	26.43	23.6	0.0946	0	0.0503	38	0	10.68	0	98.8549
	Ep 11	0	28.11	23.86	0.1579	0	0.0554	37.86	0	7.92	0.0351	97.9985
	Ep 14	0	26.63	23.64	0.1605	0.0021	0.0156	37.38	0	9.84	0.0154	97.6837
	Ep 16	0	25.36	23.67	0.2081	0	0.03	37.59	0	10.85	0.0014	97.7096
	Ep 18	0.0026	27.5	23.6	0.1312	0	0.0872	37.41	0	9.08	0.0331	97.8442
	Ep 19	0	25.58	23.32	0.4454	0	0.0593	37.88	0	11.12	0	98.4048
	Ep 21	0	26.67	23.14	0.2073	0.0107	0.1867	37.48	0	9.7	0.0174	97.4121
	Gt by ep 1	0.0085	22.08	8.05	0.5269	0.0306	0.0461	38.05	0	31.37	2.47	102.632
	Gt by ep 2	0.0023	21.87	7.75	0.968	0.1151	0.1033	37.56	0	31.25	2.31	101.9286
	Gt by ep 4	0.0321	21.88	7.67	1.0149	0.1026	0.089	37.62	0	31.49	2.03	101.9285
	Gt by ep 6	0	21.88	8.28	0.9255	0.0644	0.1389	37.72	0.0015	32.1	1.66	102.7703
	Gt by ep 7	0.0169	21.68	7.45	0.9021	0.062	0.0832	37.52	0	32.4	1.69	101.8042
	Gt by ep 9	0.0152	21.63	8.38	0.9385	0.08	0.1599	37.39	0.003	32.1	1.6444	102.3409
	Gt by ep 11	0	21.74	8.05	0.9992	0.0232	0.1043	37.72	0	31.8	1.73	102.1667
	Gt by ep 14	0.0213	21.79	7.28	1.0295	0.0362	0.0781	37.75	0.0098	32.6	1.84	102.4348
	Gt by ep 16	0.0371	21.78	7.29	1.0633	0.0569	0.1007	37.62	0.0021	32.55	1.85	102.35
	Gt by ep 18	0.023	21.94	7.13	1.0592	0.0723	0.0611	37.38	0	32.34	2.14	102.1455
	Gt by ep 19	0.0361	21.82	7.44	1.0196	0.0847	0.1722	37.7	0.0066	31.79	2.25	102.3191
	Gt by ep 21	0	21.78	7.82	0.5792	0.0357	0.0596	37.8	0.009	31.07	2.5	101.6535

Supplementary Table 5: Maximum and minimum calculated fO_2 values for intermediate zone epidote inclusions (inclusions 4, 6, 7, 16, 18, 19) in sample 09DSF-23E. The range of these values is treated as the uncertainty in the fO_2 values for the intermediate zone garnet-epidote pairs, and is shown in Figure 1c and Supplementary Figure 1. The maximum possible fO_2 is calculated using the chosen P-T conditions (variable; see Supplementary Table 1) plus the P-T uncertainty (+1kbar; +40°C) whilst the minimum possible fO_2 is calculated using the core conditions (21.5kbar; 480°C) minus the P-T uncertainty (-1kbar; -40°C). Note that the P-T conditions and calculated fO_2 values for the core and rim points do not change as the P-T conditions are fixed based on the thermodynamic modelling constraints shown in Supplementary Figure 7.

Sample	Epidote Inclusion	Temperature (°C)	Pressure (kbar)	fO2 (log)	FMQ	ΔlogFMQ
09DSF-23E						
Maximum possible fO2	Ep 1	555	16	-17.6	-19.6	2
	Ep 2	555	16	-17.1	-19.6	2.5
	Ep 4	540	22.6	-16.2	-19.4	3.2
	Ep 6	530	22.6	-16.7	-19.8	3.1
	Ep 7	530	22.6	-16.2	-19.8	3.6
	Ep 9	480	21.5	-19.1	-21.9	2.8
	Ep 11	480	21.5	-19.2	-21.9	2.7
	Ep 14	480	21.5	-18.9	-21.9	3
	Ep 16	530	22.6	-16.2	-19.8	3.6
	Ep 18	540	22.6	-16.2	-19.4	3.2
	Ep 19	540	22.6	-15.9	-19.4	3.5
	Ep 21	555	16	-17.4	-19.6	2.2
Minimum possible fO2	Ep 1	555	16	-17.6	-19.6	2
	Ep 2	555	16	-17.1	-19.6	2.5
	Ep 4	440	20.5	-21.2	-23.9	2.7
	Ep 6	440	20.5	-21.3	-23.9	2.6
	Ep 7	440	20.5	-20.8	-23.9	3.1
	Ep 9	480	21.5	-19.1	-21.9	2.8
	Ep 11	480	21.5	-19.2	-21.9	2.7
	Ep 14	480	21.5	-18.9	-21.9	3
	Ep 16	440	20.5	-20.7	-23.9	3.2
	Ep 18	440	20.5	-21.2	-23.9	2.7
	Ep 19	440	20.5	-20.9	-23.9	3
	Ep 21	555	16	-17.4	-19.6	2.2

Supplementary Table 6: Maximum and minimum calculated fO_2 values for intermediate zone epidote inclusions (inclusions 11, 12, 16, 17, 29, 31) in sample 09DSF-54A. The range of these values is treated as the uncertainty in the fO_2 values for the intermediate zone garnet-epidote pairs, and is shown in Supplementary Figure 1. The maximum possible fO_2 is calculated using the chosen P-T conditions (variable; see Supplementary Table 1) plus the P-T uncertainty (+1kbar; +40°C) whilst the minimum possible fO_2 is calculated using the core conditions (23kbar; 475°C) minus the P-T uncertainty (-1kbar; -40°C). Note that the P-T conditions and calculated fO_2 values for the core and rim points do not change as the P-T conditions are fixed based on the thermodynamic modelling constraints shown in Supplementary Figure 7.

Sample		Epidote Inclusion	Temperature (°C)	Pressure (kbar)	fO2 (log)	FMQ	ΔlogFMQ
09DSF-54A							
Maximum possible fO2		Ep 7	584	20	-14.7	-18.2	3.5
		Ep 11	530	24.1	-15.7	-19.6	3.9
		Ep 12	530	24.1	-15.4	-19.6	4.2
		Ep 16	530	24.1	-15.7	-19.6	3.9
		Ep 17	530	24.1	-15.3	-19.6	4.3
		Ep 20	475	23	-17.8	-21.9	4.1
		Ep 2	475	23	-18.3	-21.9	3.6
		Ep 24	475	23	-18	-21.9	3.9
		Ep 29	530	24.1	-15.3	-19.6	4.3
		Ep 31	530	24.1	-15.4	-19.6	4.2
		Ep 36	584	20	-15	-18.2	3.2
		Ep 37	584	20	-15.1	-18.2	3.1
		Ep 38	584	20	-14.7	-18.2	3.5
Minimum possible fO2		Ep 7	584	20	-14.7	-18.2	3.5
		Ep 11	435	22	-20.4	-23.9	3.5
		Ep 12	435	22	-20.1	-23.9	3.8
		Ep 16	435	22	-20.4	-23.9	3.5
		Ep 17	435	22	-20	-23.9	3.9
		Ep 20	475	23	-17.8	-21.9	4.1
		Ep 2	475	23	-18.3	-21.9	3.6
		Ep 24	475	23	-18	-21.9	3.9
		Ep 29	435	22	-20.1	-23.9	3.8
		Ep 31	435	22	-20.1	-23.9	3.8
		Ep 36	584	20	-15	-18.2	3.2
		Ep 37	584	20	-15.1	-18.2	3.1
		Ep 38	584	20	-14.7	-18.2	3.5

Supplementary Table 7: Maximum and minimum calculated fO_2 values for intermediate zone epidote inclusions (inclusions 6, 13, 16, 20) in sample 06MSF-6C. The range of these values is treated as the uncertainty in the fO_2 values for the intermediate zone garnet-epidote pairs, and is shown in Supplementary Figure 1. The maximum possible fO_2 is calculated using the chosen P-T conditions (variable; see Supplementary Table 1) plus the P-T uncertainty (+1kbar; +40°C) whilst the minimum possible fO_2 is calculated using the core conditions (20.2kbar; 470°C) minus the P-T uncertainty (-1kbar; -40°C). Note that the P-T conditions and calculated fO_2 values for the core and rim points do not change as the P-T conditions are fixed based on the thermodynamic modelling constraints shown in Supplementary Figure 7.

Sample		Epidote Inclusion	Temperature (°C)	Pressure (kbar)	fO2 (log)	FMQ	ΔlogFMQ
06MSF-6C							
Maximum possible fO2		Ep 6	530	21.6	-16.8	-19.9	3.1
		Ep 11	470	20.2	-19.1	-22.5	3.4
		Ep 13	530	21.6	-16.4	-19.9	3.5
		Ep 16	530	21.6	-16.8	-19.9	3.1
		Ep 20	530	21.6	-16.4	-19.9	3.5
		Ep 21	560	22	-15.6	-18.8	3.2
		Ep Rim	560	22	-15.1	-18.8	3.7
Minimum possible fO2		Ep 6	430	19.2	-21.9	-24.5	2.6
		Ep 11	470	20.2	-19.1	-22.5	3.4
		Ep 13	430	19.2	-21.5	-24.5	3
		Ep 16	430	19.2	-21.9	-24.5	2.6
		Ep 20	430	19.2	-21.5	-24.5	3
		Ep 21	560	22	-15.6	-18.8	3.2
		Ep Rim	560	22	-15.1	-18.8	3.7