Appendix DR1. Analytical techniques and methods

Whole-rock major element compositions were determined with a PHILIPS Magix Pro (PW-2440) X-ray fluorescence equipment (University of Granada) using a glass beads, made of 0.6g of powdered sample diluted in 6g of $Li_2B_4O_7$.

Mineral compositions were obtained using WDS with a CAMECA SX-100 microprobe (University of Granada) operated at 15 kV and 15 nA. Amphibole composition was normalized following the procedure of Leake et al. (1997), and Fe^{3+} was estimated after the method of Schumacher (in Leake et al., 1997). Garnet composition was normalized to 12 oxygens and 8 cations, with Fe^{3+} estimated by stoichiometry. Epidote and plagioclase were normalized to 12.5 and 8 oxygens, respectively, and $Fe_{total}=Fe^{3+}$. White mica and chlorite were normalized to 22 and 28 oxygens, respectively, and $Fe_{total} = Fe^{2+}$.

Elemental X-ray images were obtained with the same machine operated at 20 kV, 150 nA beam current, step (pixel) size of 7 µm and counting time of 30 ms. The images were processed with Imager software (Torres-Roldán and García-Casco, unpublished) to obtain quantitative images of garnet composition (expressed in atoms per 12 oxygen formula unit). The procedure of Bence and Albee (1968) was followed for matrix correction by using the composition of an internal garnet standard analyzed with the electron microprobe. In the images the other minerals are masked out, and the resulting images are overlain onto a gray-scale "Z" image calculated by the sum of the products of the counts by atomic number (Si, Ti, Al, Fe, Mn, Mg, Ca, Na, Ba, K, P, F and Cl). The profile was extracted from the quantified X-ray images of Si, Al, Fe, Mn, Mg, and Ca with a resolution of 7 µm/point (total number of points plotted: 518) and transformed to continuous lines by regression. The atomic concentration of elements per formula units is abbreviated apfu, the Mg number of minerals (Mg#) is expressed as $Mg/(Mg+Fe^{2+})$.

Solution models used in the thermodynamic calculations for amphibole, chlorite, epidote, plagioclase and muscovite are from Diener et al. (2007), Holland et al. (1998), Holland and Powell (1998), Holland and Powell (2003) and Coggon and Holland (2002) respectively, and for garnet and ilmenite from White et al. (2005).

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Appendix DR2. Whole rock and mineral compositions. Garnet, amphibole, epidote, plagioclase, chlorite and muscovite are normalized to 12, 23, 12.5, 8, 28 and 22 oxygens respectively.

Mineral		Grt	Grt	Grt	Grt	Amp	Amp	Amp	Amp	Amp	Amp	Ep	Ep	Ep	Pl	Chl	Chl	Chl	Ms	Ms	Ms
Zone	WR	pre-peak	Peak-1	Retro-1	Peak-2	Peak-1	Retro-1	Retro-1	Peak-2	Retro-2	Retro-2	Peak-2	pre-peak	Retro-2	pre-peak	pre-peak	Retro-1	Retro-2	Retro-2	Peak-1	Peak-2
SiO_2	44.05	37.71	38.00	37.71	37.82	45.88	54.18	54.47	41.29	57.21	51.29	38.77	38.12	38.75	68.72	25.30	26.26	26.47	50.29	49.92	46.56
TiO_2	2.30	0.24	0.12	0.12	0.14	1.00	0.10	0.07	0.47	0.21	0.23	0.11	0.16	0.18	0.00	0.04	0.03	0.06	0.15	0.15	0.59
Al_2O_3	13.22	21.05	21.43	21.00	21.28	11.97	2.78	2.52	18.24	9.65	6.41	28.74	28.77	28.79	19.61	17.91	19.75	20.64	27.55	27.92	29.63
Cr_2O_3		0.02	0.05	0.01	0.00	0.01	0.01	0.01	0.02	0.02	0.00	0.04	0.00	0.06	0.00	0.04	0.06	0.00	0.04	0.05	0.01
FeO	14.39	27.44	28.46	21.18	28.36	13.00	10.80	11.30	15.52	14.09	11.60	5.88	5.74	5.69	0.36	32.44	25.32	21.72	3.16	3.10	2.09
MnO	0.25	3.83	1.69	6.95	1.71	0.20	0.20	0.22	0.24	0.11	0.14	0.23	0.25	0.23	0.02	0.98	0.54	0.21	0.02	0.03	0.02
MgO	10.29	2.47	4.32	0.91	3.31	12.11	17.08	16.91	8.53	8.83	15.16	0.05	0.10	0.05	0.00	10.22	15.84	18.47	2.97	2.99	2.45
NiO		0.00	0.02	0.00	0.04	0.01	0.02	0.02	0.00	0.02	0.03	0.00	0.01	0.00	0.01	0.00	0.00	0.03	0.04	0.04	0.00
CaO	9.78	8.63	7.14	12.92	8.78	10.33	11.56	11.52	9.73	0.48	11.02	23.77	22.38	23.65	0.10	0.10	0.03	0.01	0.07	0.07	0.01
BaO		0.00	0.00	0.01	0.00	0.02	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.07	1.79
Na_2O	1.81					2.36	0.77	0.75	3.12	7.20	1.50	0.00	0.00	0.00	12.01	0.08	0.02	0.01	0.33	0.34	0.64
K_2O	0.34					0.25	0.19	0.05	0.44	0.02	0.14	0.01	0.01	0.01	0.04	0.05	0.03	0.01	10.36	10.45	9.72
P_2O_5	0.18																				
Total	96.61	101.39	101.23	100.81	101.44	97.30	97.83	97.99	97.78	98.02	97.66	97.75	95.66	97.56	100.97	87.44	88.05	87.81	95.15	95.30	93.64
Si		2.97	2.97	2.99	2.96	6.68	7.69	7.73	6.07	7.96	7.33	3.00	3.00	3.00	2.98	5.63	5.53	5.47	6.76	6.71	6.43
Ti		0.01	0.01	0.01	0.01	0.11	0.01	0.01	0.05	0.02	0.02	0.01	0.01	0.01	0.00	0.01	0.00	0.01	0.02	0.02	0.06
Al		1.96	1.97	1.96	1.97	2.05	0.47	0.42	3.16	1.58	1.08	2.62	2.67	2.63	1.00	4.70	4.91	5.03	4.36	4.42	4.82
Cr		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.00
Fe3+		0.00	0.00	0.00	0.01	0.27	0.19	0.18	0.35	0.23	0.24	0.38	0.38	0.37	0.01						
Fe2+		1.81	1.86	1.40	1.85	1.31	1.10	1.16	1.56	1.41	1.14					6.04	4.46	3.75	0.36	0.35	0.24
Mn		0.26	0.11	0.47	0.11	0.02	0.02	0.03	0.03	0.01	0.02	0.02	0.02	0.02	0.00	0.18	0.10	0.04	0.00	0.00	0.00
Mg		0.29	0.50	0.11	0.39	2.63	3.61	3.58	1.87	1.83	3.23	0.01	0.01	0.01	0.00	3.39	4.98	5.69	0.60	0.60	0.51
Ni		0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.02	0.00
Ca		0.73	0.60	1.10	0.74	1.61	1.76	1.75	1.53	0.07	1.69	1.97	1.89	1.96	0.00	0.02	0.01	0.00	0.01	0.01	0.00
Ba		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10
Na						0.67	0.21	0.21	0.89	1.94	0.42	0.00	0.00	0.00	1.01	0.03	0.01	0.00	0.09	0.09	0.17
K						0.05	0.03	0.01	0.08	0.00	0.03	0.00	0.00	0.00	0.00	0.01	0.01	0.00	1.78	1.79	1.71
#Mg		0.14	0.21	0.07	0.17	0.67	0.77	0.76	0.54	0.56	0.74					0.36	0.53	0.60	0.63	0.63	0.68