

Table S1: Experimental starting compositions

	JP1	BAS	AOB	ZrTi	NSR-16
SiO ₂	51.66	44.82	44.68	44.95	51.70
TiO ₂	0.34	2.5	2.48	11.20	1.30
Al ₂ O ₃	13.85	14.73	14.46	12.22	19.52
FeO		11.03			9.46
Fe ₂ O ₃	6.34		15.41	6.80	
MnO	0.15	0.19	0.18	0.16	0.26
MgO	13.74	9.69	10.21	13.07	5.40
CaO	9.94	10.05	9.00	7.43	8.61
Na ₂ O	2.69	4.01	2.58	0.83	3.35
K ₂ O	0.66	1.85	0.77	0.03	0.24
Cr ₂ O ₃	0.62		0.25	0.59	
P ₂ O ₅		0.94			0.17
ZrO ₂				3.69	
Total	99.99	99.81	100.02	100.97	100.01

JP1 is a synthetic oxide mix, BAS is a natural basanite glass, from Green et al. (2000), AOB is a synthetic alkali olivine basalt and NSR-16 a synthetic basaltic glass.

Table S2: Trace elements and amount added to starting compositions.

	JP1	BAS*	AOB	ZrTi	NSR-16
	ppm	ppm	ppm	ppm	ppm
Zn	250	-	250	250	-
Ni	250	-	250	250	-
Co	250	-	250	-	-
Cr	250	-	250	-	-
V	100	-	100	100	300
Sc	100	-	100	300	150
Ti	100	-	100	-	-
Y	50	33	50	50	300
La	50	54	150	150	200
Ce	200	110	300	300	50
Nd	100	42	200	200	50
Sm	50	8.7	50	50	60
Eu	100	2.6	100	100	80
Gd	100	-	100	100	100
Er	100	-	100	100	250
Yb	150	2.2	150	150	-
Lu	250	0.3	250	250	200
Nb	200	-	200	200	-
Ta	200	5	300	300	50
Zr	50	286	50	-	150
Hf	50	5.3	50	50	50
Th	200	-	300	300	-
U	200	-	200	200	-
Pb	200	-	200	200	-
Sr	400	1094	400	400	100
Ga	100	18	100	100	-
Li	100	200	300	500	10
Ba	-	-	-	-	400
B	-	-	-	-	10

* trace elements in BAS are those measured by Green et al. (2000)
 except Li which was added for this study.

Table S3: List of published experimental studies included in our thermometer evaluation with T , P and starting composition of data

Author	T (°C)	P (GPa)	Bulk
Adam and Green (2006)	1180	3.5	lherzolite
Bennett et al. (2004)	1330	3	CMAS eclogite
Green et al. (2000)	1200	4	tholeiite
Green et al. (2000)	1100	3	basanite
Green et al. (2000)	1160	4	tholeiite
Hauri et al. (1994)	1430	2.5	high Al basalt
Klein et al. (2000)	1100	1.5	granulite xenolith
Klein et al. (2000)	1050	1.5	granulite xenolith
Klemme et al. (2002)	1400	3	eclogite
Kuzyura et al. (2010)	1265	7	silicocarbonatite
Kuzyura et al. (2010)	1265	7	silicocarbonatite
McDade (unpublished)	1495	3	Garnet-Peridotite
Salter and Longhi (1999)	1537	2.8	MORB
Salter and Longhi (1999)	1530	2.8	MORB
Salter and Longhi (1999)	1525	2.8	MORB
Salter et al. (2002)	1600	2.8	MORB
Tuff and Gibson (2007)	1475	3	ferropicrite
Tuff and Gibson (2007)	1425	3	ferropicrite
Tuff and Gibson (2007)	1750	7	ferropicrite
Withers (1997)	1470	3	basalt
Withers (1997)	1487	3	basalt