

SUPPLEMENTARY DATA 2

Table SD2-1. LA-ICP-MS trace element analysis instrumental setup and operating conditions (samples AV16-21, AV16-44, AV16-47).

Laboratory and Sample Preparation	
Laboratory name	Department of Geological Sciences, University of Bern
Sample type/mineral	Garnet
Sample preparation	Thin section
Imaging	Optical microscope, EPMA compositional maps
Laser ablation system	
Make, Model and type	GeoLasPro (Compex 102; Lambda Physics)
Ablation cell and volume	In-house built rectangle cell brought down to a round base area, volume ca. 21 cm ³
Laser wavelength	193 nm ArF excimer laser
Fluence	8.0 J•cm ⁻²
Repetition rate	5, 10 Hz
Spot size	32, 60 µm, round
Sampling mode / pattern	Single spot
Carrier gas	He (1.000 L•min ⁻¹) and H ₂ (0.008 L•min ⁻¹) cell gas flow, Ar make-up gas combined using a Y-piece 50% along the sample transport line to the torch
Background collection	40 s
Ablation duration	40 s
Wash-out delay	20 s
Cell carrier gas flow	1.008 L•min ⁻¹
ICP-MS Instrument	
Make, Model and type	Elan DRC-e (Perkin Elmer) ICP-QMS
Sample introduction	Via conventional tubing
RF power	1550 W
Make-up gas flow	0.65 – 0.70 L•min ⁻¹ Ar
Detection system	Dual (cross-calibrated pulse/analog modes)
Integration time per peak	10 to 20 ms
Data Processing	
Gas blank	30 seconds on-peak
Calibration strategy	NIST-612 glass as primary reference material, BCR-2G glass as secondary reference material
Reference Material info	NIST-612 (Jochum et al. 2011) BCR-2G (Jochum et al. 2005)
Data processing package	SILLS (Guillong et al. 2008)
Mass discrimination	Standard-sample bracketing normalized to reference material
Internal standardization	Si µg/g 254300
Accuracy and precision	BCR-2G concentrations within 15% of nominal value, Y, Ho and Er within 20% SD on repeated analyses typically within 5 %

Table SD2-2. LA-ICP-MS trace element analysis instrumental setup and operating conditions (samples AV16-45, AV17-07, AV17-16, FG1249, FG1315, VC10-04).

Laboratory and Sample Preparation	
Laboratory name	Institut für Geologie, Universität Bern
Sample type/mineral	Garnet
Sample preparation	Thin section pieces mounted in 1 inch resin mount
Imaging	Optical microscope, EPMA compositional maps
Laser ablation system	
Make, Model and type	RESOLUTION Laser System SE, ATL Laser head
Ablation cell and volume	Laurin Technic S155 Cell, two volumes cell, volume ca. 1-2 cm ³
Laser wavelength	193 nm
Fluence	4 J•cm ⁻²
Repetition rate	5 Hz
Spot size	20 µm, round
Sampling mode / pattern	Single spot
Carrier gas	100% He, Ar make-up gas (450 ml/min) and N ₂ (3ml/min) combined using the Squid® device from RESOLUTION Instruments.
Background collection	30 secs
Ablation duration	40 secs
Wash-out delay	20 secs
Cell carrier gas flow	0.75 l/min
ICP-MS Instrument	
Make, Model and type	Agilent 7900, Q-ICP-MS
Sample introduction	Via conventional tubing
RF power	1300 W
Make-up gas flow	0.87 l/min Ar
Detection system	Single collector secondary electron multiplier
Integration time per peak	8 to 30 ms
Data Processing	
Gas blank	30 seconds on-peak
Calibration strategy	GSD-1g glass as primary reference material, NIST-612 glass as secondary reference material
Reference Material info	GSD-1g (Jochum et al. 2005) NIST-612 (Jochum et al. 2011)
Data processing package	IOLITE (Paton et al. 2011)
Mass discrimination	Standard-sample bracketing normalized to reference material
Internal standardization	Si wt% 17.53
Accuracy and precision	NIST-612 concentrations within 10% of nominal value STDEV on repeated analysis within 2 %