**Zircon U-Pb dating methods for 2013 analyses**

Zircon U-Pb dating was performed on an Agilent 7500cs quadrupole ICPMS with a 193 nm Coherent Ar-F gas laser and the Resonetics S155 ablation cell at the University of Tasmania in Hobart. The downhole fractionation, instrument drift and mass bias correction factors for Pb/U ratios on zircons were calculated using 2 analyses on the primary (91500 standard of Wiendenbeck et al. 1995) and 1 analysis on each of the secondary standard zircons (Temora standard of Black et al. 2003 & JG1 of Jackson et al. 2004) analysed at the beginning of the session and every 15 unknown zircons (roughly every 1/2 hour) using the same spot size and conditions as used on the samples. Additional secondary standards (The Mud Tank Zircon of Black & Gulson 1978, Penglai zircons of Li et al. 2010, and the Plesovice zircon of Slama et al. 2008) were also analysed. The correction factor for the 207Pb/206Pb ratio was calculated using large spots of NIST610 analysed every 30 unknowns and corrected using the values recommended by Baker et al. (2004).

Each analysis on the zircons began with a 30 second blank gas measurement followed by a further 30 seconds of analysis time when the laser was switched on. Zircons were sampled on 32 µm spots using the laser at 5 Hz and a density of approximately 2 J/cm2. A flow of He carrier gas at a rate of 0.35 litres/minute carried particles ablated by the laser out of the chamber to be mixed with Ar gas and carried to the plasma torch. Isotopes measured were 49Ti, 56Fe, 90Zr, 178Hf, 202Hg, 204Pb, 206Pb, 207Pb, 208Pb, 232Th and 238U with each element being measured every 0.16 s with longer counting time on the Pb isotopes compared to the other elements. The data reduction used was based on the method outlined in detail in Meffre et al. (2008) and Sack et al. (2011) similar to that outlined in Black et al. (2004) and Paton et al. (2010).

Element abundances on zircons were calculated using the method outlined by Kosler (2001) using Zr as the internal standard element, assuming stoichiometric proportions and using the NIST610 to standard correct for mass bias and drift.

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