

U-Pb age, Hf-isotope and trace-element composition of zircon megacrysts from the Juina kimberlites, Brazil

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Forty zircon megacrysts were recovered from the diamondiferous Pandrea kimberlitic pipes comprising the Chapadão cluster in the Juina District. The Juina District in the Mato Grosso State is one of major diamond-producing areas in Brazil [1]. The recovered zircons were analysed sequentially by determination of U-Th-Pb isotopic ratios via LAM-ICPMS, and by Lu-Hf isotopic analysis via LAM-MC-ICPMS.

Under the cold cathode luminescence (CL) microscope, zircons have brownish, yellowish and rarely pinkish colours, with yellowish hues predominating. Most of the investigated crystals are homogeneous, suggesting their growth under stable conditions.

The U-Pb age determinations for zircons from the three different Pandrea pipes are almost identical (93.5 ± 0.7 , 93.7 ± 0.7 and 93.7 ± 0.7 Ma), with a weighted mean age of 93.6 ± 0.4 Ma (95 % confidence; MSWD = 0.83; probability 0.76) that is significantly older than the age of other, barren and weakly diamondiferous, kimberlites in the Juina area.

The Hf isotopic composition of the Juina zircons well corresponds to the average kimberlitic trend, according to data by Griffin *et al.* [2]. Both the initial $^{176}\text{Hf}/^{177}\text{Hf}$ values (average $^{176}\text{Hf}/^{177}\text{Hf} = 0.282911 \pm 22$) and ϵHf (range from +5.9 to +8.3) fall between the values expected for a chondritic reservoir, and those expected for zircons crystallized from magmas with a depleted-mantle source.

The trace-element composition of Juina zircons, characterised by low REE, U (6–30 pm) and Th (2–12 ppm) contents, is typical of mantle-derived zircons [3].

- [1] Kaminsky *et al.* (2001) *Contrib. Miner. Petrol.* **140**, 734-753. [2] Griffin *et al.* (2000) *Geochim. Cosmochim. Acta* **64**, 133-147. [3] Belousova *et al.* (2002) *Contrib. Miner. Petrol.* **143**, 602-622.