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Tonian emplacement of ophiolites in the southern Brasiliano Orogen delimited by U-Pb-Hf isotopes of zircon from metasomatites

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Abstract

Key parameters in the evolution of the oceanic crust in the little-known Tonian period of the Brasiliano Orogen are presently established through the finding and characterization of zircon in chloritite and tourmalinite enclosed in serpentinite. The Ibaré and Palma ophiolites were selected for the study and both are from the juvenile São Gabriel terrane, Rio Grande do Sul state, Brazil. U-Pb and Lu-Hf isotopic analyses of zircon from metasomatites and a volcanoclastic rock with laser ablation indicate similar ages in both ophiolites, respectively 726 ± 2 Ma and 722 ± 3 Ma (metasomatites) and 758 ± 4 Ma (volcanoclastic rock). Other three representative ages recorded in the metasomatites are 880 ± 12, 836 ± 6 and 780 ± 5 Ma, interpreted as successive serpentinization events. Mantle Hf isotope compositions of zircon in the