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U-Pb age dating carried out in the Abitibi Subprovince, 2004-2005 projects

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Abstract

This report presents the results of U-Pb geochronology analyses on zircons carried out in 2004-2005 on 8 samples collected in Abitibi. The samples were analysed by two methods: isotopic dilution (ID-TIMS) or laser ablation (LA-MC-ICPMS).

Abitibi Subprovince, Lac Olga area:

Sample SGNO-2004-08 is an altered felsic volcanic rock from the eastern extension of the Lac Watson Group in the Lac Olga and Lac au Goéland areas (32F/10). The analyses by isotopic dilution and laser ablation yielded a low precision age of 2722.1 ± 6.4 Ma that seems to confirm the hypothesis of a correlation between these volcanic rocks and the Lac Watson Group, located further west.

Sample SGNO-2004-07 comes from the alkaline Montviel Intrusion (32F/15). This ijolite sample yielded a Paleoproterozoic age of 1894.2 ± 3.5 Ma. Few intrusions of this age are known within the Superior Province. The best known intrusion is probably the Cargill Carbonatite in Ontario located at the border of the Kapuskasing tectonic Zone.

Abitibi Subprovince and Grenvillian Parautochthonous, Grenville Front area south of Chibougamau:

Sample SGNO-2004-01 represents a polygenetic conglomerate from the Caopatina Formation (32G/07). Laser ablation analyses of 55 zircon crystals yielded 207Pb/206Pb ages between 2707 Ma and 2802 Ma. The maximum age for deposition is estimated at 2707.3 ± 2.3 Ma, which suggests the occurrence of volcanic rocks of this age in the Caopatina Segment. The oldest observed age is 2802.2 ± 3.2 Ma. The age of a majority of zircons is distributed between 2725 Ma and 2735 Ma with a mean age of 2730.0 ± 1.3 Ma. Statistical treatment of these results makes it possible to recognize three ages: 2726.3 ± 0.5 Ma, 2729.4 ± 0.3 Ma and 2734.5 ± 0.9 Ma.

Sample SGNO-2004-06 comes from a coronitic garnet-bearing gabbro dyke (32B/14) from the Grenvillian Parautochthonous. The best emplacement age estimate for this gabbro is 2423 ± 16 Ma, with a strong effect from Grenvillian metamorphism around 1 Ga.

Sample SGNO-2004-11 is from a quartz diorite intrusion of the Grenvillian Parautochthonous (32G/08). An emplacement age of 2703.9 ± 3.4 Ma was obtained, which represents the minimum age of the host Archean units in the area.

Abitibi Subprovince, Rouyn-Noranda area:

A sample (SGNO-2004-05) of spherulitic and porphyritic rhyolite with quartz phenocrysts was collected in the Duprat-Montbray Formation of the Blake River Group, west of the Flavrian Pluton (32D/06). This rhyolite yielded an age of 2696.9 ± 3.4 Ma, similar to those obtained up to now for the Blake River Group volcanic rocks (2701-2696 Ma).

Sample SGNO-2004-09 comes from the dacite-rhyodacite unit of the Lac Turcotte (32D/06), which is equivalent to the Millenbach Rhyolite. This unit belongs to the Noranda Formation of the Blake River Group, characterized by the occurrence of several massive sulphide lenses. This porphyritic dacite was dated at 2698.5 ± 2.0 Ma.

A sample of polygenetic conglomerate (SGNO-2004-04) was collected in the Duparquet Formation, north of the Porcupine-Destor Fault (32D/06). A maximum deposition age of 2678.9 ± 2.8 Ma was obtained for the Duparquet Formation. Nearly 40 analyses yielded ages between 2686.7 Ma and 2705.5 Ma. The statistical treatment of these data demonstrates the occurrence of six age groups: 2689.4 ± 0.5 Ma, 2693.3 ± 0.6 Ma, 2696.7 ± 1.6 Ma, 2699.7 ± 0.2 Ma, 2701.7 ± 0.3 Ma and 2703.6 ± 0.5 Ma. Nearly 14 crystals returned older ages from 2720 Ma to 2800 Ma and one crystal returned an age as old as 3136.9 ± 0.2 Ma.

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