U-Pb age dating in the Abitibi Subprovince in 2005-2006

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Abstract

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

Grenvillian Parautochthon, Grenville Front sector south of Chibougamau:
Sample SGNO-2005-07 is from an intermediate tuff unit collected in the area south of Chibougamau (NTS 32G08). The age of 1002.5 Ma corresponds to severe Grenvillian metamorphism which completely reset the U-Pb isotope system.

Abitibi Subprovince, Chibougamau-Chapais sector:
Sample SGNO-2005-06 represents a polygenic conglomerate from the Hauy Formation (NTS 32G10). The age of 2691.7 ±2.9 Ma obtained for the sample corresponds to the maximum age of sedimentation. This age is somewhat more recent than previous estimates derived for the deposition of Hauy sediments (2715-2705 Ma). It is contemporary with the emplacement of the syntectonic and alkaline intrusions of the northern part of the Abitibi and also close to the maximum age of the Taibi Group conglomerate in the Casa Berardi region.

Abitibi Subprovince, Lebel-sur-Quévillon sector:
Sample SGNO-1998-08 is a microporphyritic rhyolite belonging to the Quévillon Group (NTS 32F02). Analysis of zircon crystals from this rhyolite gave an emplacement age of 2716.4 ±1.1 Ma, confirming recent data indicating that the felsic volcanic rocks of the Lebel-sur-Quévillon region formed between 2718 Ma and 2714 Ma.

Abitibi Subprovince, sector WNW of Joutel:
Sample SGNO-2005-04 is a sericitized rhyolite from the unit that hosts the Estrades volcanogenic massive sulphide deposit (NTS 32E10). We obtained an age of 2719.8 ±2.8 Ma, which is comparable, within error limits, to the age obtained for a brecciated andesite from the Collines Cartwright Group in the Joutel sector.

Abitibi Subprovince, Barraute sector:
Sample SGNO-2005-02 comes from the western part of the Abcourt-Barvue volcanogenic massive sulphide deposit (NTS 32C12). The sampled unit is a dacite tuff transformed into sericite-carbonate-chlorite schist in the Abcourt deformation zone. The sample gave an age of 2706.4 ±3.3 Ma. The episode of volcanism is synchronous with the emplacement age of the rocks at the top of the Malartic Group in the Val-d'Or region (2714–2704 Ma).

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Abitibi Subprovince, Rouyn-Noranda sector:

Sample SGNO-2005-05 comes from a rhyolitic intrusion with a spherulitic microstructure belonging to the Fish-roe Member. This sample was collected north of Rouyn-Noranda (NTS 32D06) in order to compare its age with the age of 2700.6 ±1.6 Ma obtained previously for the same unit south of this town and to determine the age of the upper part of the Noranda Formation. The spherulitic intrusion yielded an age of 2696.5 ±2.4 Ma. This points to the existence of at least two levels of the same composition but different ages within the Blake River Group. In addition, this dating indicates that the top of the Noranda Formation cannot be younger than 2696 Ma.

A pyritized albitite dike was sampled along the Porcupine-Destor dike (NTS 32D06) to determine its age and compare the result with the age of albitite dikes in Ontario. In Ontario, these intrusions have been used to establish a chronology of the gold occurrences associated with the Porcupine-Destor fault. The ages obtained from our sample range from 2714 Ma to 2685 Ma, suggesting that most of the zircons in the sample actually represent xenocrystals. The youngest concordant analysis gives a maximum age of 2685 ±2 Ma for the dike, which is slightly older than the age range of 2673-2682 Ma obtained for albitite dikes in Ontario.

The feldspar megacryst facies of the Beattie Syenite (NTS 32D11) was sampled to determine the age of this intrusion which hosts several of the gold deposits of the Duparquet mining camp. The lath facies of the same syenite had previously been dated at 2681.5 ±1.0 Ma. Our analyses gave a mean $^{207}Pb/^{206}Pb$ age of 2682.9 ±1.1 Ma, which is similar to that of the lath facies.

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