

Assessment of sillimanite and muscovite potential northeast of Mont-Laurier

N'golo Togola¹ and Kamal N.M. Sharma¹

RP 2005-06(A)

Keywords: industrial minerals, sillimanite, muscovite, Grenville, Mont-Laurier

Abstract

During the summer of 2004, we carried out fieldwork northeast of Mont-Laurier, within the Central Metasedimentary Belt of the Grenville Province. This area includes NTS sheets 31J/14, 31J/15, and 31O/02. The aim of the current study is to assess the potential of sillimanite and muscovite showings as industrial mineral sources.

In the Mont-Laurier area, sillimanite and muscovite showings associated with paragneisses and diatexites have been identified by the ministère des Ressources naturelles et de la Faune. During the summer of 2004, our fieldwork consisted of a detailed petrographic description and sampling of the various showings. Chemical analyses of major elements were carried out on samples from the Lac de la Dame, Lac Brockaby, Lac Beauregard, Lac de l'Oursière, Lac Ribereys, Lac Daillon, Lac à la Côte Jaune, and Lac Rouge areas, in order to determine their Al_2O_3 content. Petrographic studies of thin sections and sillimanite separation tests were then performed on six representative samples from the Lac Brockaby, Lac Beauregard, Lac de l'Oursière, and Lac Rouge areas, allowing us to better define the quantity and quality of sillimanite and muscovite within paragneiss and diatexite units.

The Lac de la Dame area, northeast of Sainte-Anne-du-Lac, seems to possess a good potential for sillimanite, particularly in sillimanite-muscovite-grenat-biotite-graphite paragneiss units. Thin sections revealed that this rock contains between 10 and 25 % sillimanite. The sillimanite fibres seem to be of good quality and their link with the other minerals is usually simple.

The petrographic work and sillimanite separation tests, carried out on a few samples from the Lac Brockaby, Lac de l'Oursière, and Lac Ribereys areas, revealed that the sillimanite content (5 to 15 %) in paragneisses is relatively low and that grain-size ranges from medium to fine. The production of sillimanite concentrate for industrial use would thus be difficult and expensive. Regarding the Lac Beauregard, Lac Ribereys, Lac Daillon, Lac à la Côte Jaune, and Lac Rouge areas, the sillimanite content ranges from 3 to 15 %, and the sillimanite crystals in diatexites and mafic paragneisses are usually rather fine grained. Consequently, the separation of sillimanite from the other minerals of the rock would be more difficult to perform and above all very expensive.

The petrographic work revealed a low muscovite content in paragneisses and diatexites from the visited areas. The abundance of muscovite in the samples is about 1 to 5 %.

For the work to come, we propose a sampling of the paragneiss horizons in the northern part of NTS sheet 31O/02 and southern part of 31O/07, which were mapped by the ministère des Ressources naturelles et de la Faune. Sampling of a sillimanite-rich paragneiss horizon (NTS sheet 31J/06), mapped by the Geological Survey of Canada, should also be carried out. Analyses of these units will determine their sillimanite and muscovite contents. This will complete the current assessment of the sillimanite and muscovite potential in the Mont-Laurier area.