

MICROTEKTITES FROM THE LARKMAN NUNATAK, TRANSANTARCTIC MOUNTAINS.

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Introduction: Microtektites were discovered in glacial moraine from the Larkman nunatak (hereafter LK; 85°46'S, 179°23' E) during the 2006-2007 ANSMET expedition. The glacial moraine is an East-West plateau extending ca. 1.5 km by 700 m which rises up to 30 m above the surrounding meteorite-rich blue ice. It is separated from the nunatak by a depression up to 500 m. Samples were collected from the southern edge of a boulder ridge approximately 40 m into the moraine and located approximately half way through the moraine East-West. Due to the lack of magnetic signal, microtektites were optically separated using a binocular microscope. So far, 35 microtektites have been collected in the 100-800 µm size fraction.

Description: Microtektites size ranges from 107 to 388 µm. The size distribution of the 35 samples does not show a well-defined peak in this size range. The fact that we have not found any particle bigger than 388 µm in the 100-800 µm size fraction of the moraine suggests that this may roughly represent the upper size limit of microtektites in the LK moraine. The particles are pale-yellow, transparent and glassy in aspect. All particles exhibit a spherical shape. The surface of the particles is generally smooth and clean, except for one sample showing pits typically ~10 µm in size scattered on its surface. The polished sections of 13 microtektites observed under BSE-SEM show a homogeneous contrast in the interior of the particles, apart for one particle in which darker areas are observed along the margin. The presence of pits on the surface of a particle and of areas with lower Z-contrast in BSE images on the margin of another one is attributed to a very limited aqueous alteration occurring during their storage in the moraine.

Chemical composition: SEM-WDS and LA-IPC-MS were used to determine the major and trace elements composition of the particles, respectively. SiO₂ content varies from 55.53 to 75.73 wt%. Other major element oxides except for K₂O show a negative correlation with silica. The trace elements composition of 12 particles is homogeneous, apart from Rb and Cs contents. Furthermore, the trace elements composition appears to match closely the composition of the microtektites from the Transantarctic Mountains (TAM), the Australasian microtektites and the average Upper Continental Crust composition [1, 2, 3].

Discussion: The microtektites from LK show affinities in term of aspect and chemical composition with the TAM microtektites discovered >1000 km further north in the Northern Victoria Land [1]. The latter represent the southernmost extension of the Australasian strewnfield. The smaller size of microtektites from LK compared to the TAM ones is consistent with a deposition further from the yet to be found crater from which they originated. However, more work is needed in order to affiliate the LK microtektites with a known strewnfield. Such work include Ar-Ar dating.

References: [1] Folco et al. 2008. *Geochimica et Cosmochimica Acta* 73:3694-3722. [2] Glass B.P. and Koeberl C. 2006. *Meteoritics and Planetary Science* 41:305-326. [3] Taylor S.R. and McLennan. 1995. *Reviews of Geophysics* 32:241-265.

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