

A new Tektite Strewnfield in Atacama, Chile.

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Introduction: Tektites and impact glasses can be produced during impact events [e.g., 1, 2]. While most are related to known craters, some are not, and their very limited number of occurrences impedes our comprehension of their conditions of formation. Only five strewnfield of tektites are known to date: Australasian, Central European (Moldavites), Ivory Cost (Ivoirites), North American (Bediasites and Georgiites), and the poorly documented Central American strewnfield. We report here on a new occurrence of possible tektites recently discovered in the Atacama desert, Chile.

Samples and methods: Five samples were collected by two of us (M.W. and M.W.) in 2012, and field work in 2013 allowed the collection of more than 3000 pieces over an area of the order of 20 km². These glasses were analyzed by EDS-SEM, EPMA, FTIR, ICP-AES, and ICP-MS.

Results: Samples range from 4 to 35 mm in the widest dimension, with a mean weight of 500 mg. All are aerodynamically shaped black glasses, with minor vesicularity. SEM observation reveals mingling textures of glasses varying from Fe-poor (ca. 5 wt.% FeO) to Fe-rich (15 wt.% FeO), with occasional inclusions of white glass with compositions > 99 wt.% SiO₂ (lechatelierite). Water content, analyzed by FTIR, is ca. 130 ppm. Magnetic susceptibilities show a mode at 180 nm³/kg [2]. These characteristics design these glasses as tektites.

Target and impactor compositions. Bulk compositions are dacite-like. REE patterns and Sr-Nd isotopic compositions are compatible with local volcanic terranes. EPMA analyses of the heterogeneous glass within a given tektite show a positive correlation of Ni and Fe contents, indicating significant contamination by an iron impactor. Bulk analyses of various individual tektites show the same Fe-Ni correlation, as well as a positive Co-Ni correlation.

Discussion: Although these glasses display all the characteristics of tektites, the important contamination by the impactor relates them to impact glasses, as is the case with irghizites [1]. LA-ICP-MS and Mossbauer analyses will be used to further document the composition of these tektites. The relative homogeneity of the target material and the level of contamination are suggestive of a nearby, rather small impact crater that has not yet been found. Dating the impact age is ongoing, using ³⁹Ar-⁴⁰Ar and fission-track methods.

References: [1] Koeberl C. 1986. *Annual Review of Earth and Planetary Sciences* 14:323-350. [2] McCall J. 2001. The Geological Society. [3] Rochette P. et al. 2014. *77th Annual Meeting of the Meteoritical Society*.