

Geophysical Research Abstracts, Vol. 8, 05412, 2006
SRef-ID: 1607-7962/gra/EGU06-A-05412
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The structure of irgizites of the Zhamanshin crater

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Within the problem of genesis of glassy irgizites from the Zhamanshin crater the study of their structure was carried out.

The investigated irgizites are characterized by the prolate shape of the small biaxial ellipsoids of revolution. Their sculptural surface is complicated represented by ellipsoidal, prolate and rounded - vortex fluxions, e. g. Their surface is porous. Glass is dim, opaque and friable. The prolate shape of the samples and presence of knags on their surface indicate that their formation connected with a melt material eruption from the crater. Microprobe analysis has confirmed affinity of the studied samples to irgizites.

There are three varieties of deformation structures which occurrence is connected with various stages of formation. The first type is represented by cracks filled dark brown glass being a result of a sharp cooling drop in process of a melt spatter. Cracks, breaking all surface of the glass at the system of microblocks. The second type of deformations connected with rounded and oval drop-shaped inclusions of a glass from 1.0 - 1.5 mm inside, which were formed at the drops falling on a cooling melt. The character of deformation structures point out that the similar structures can result from high pulsing loading and they are different from another deformations.

The presence of spherical pores and hollows testifies of a high gas saturation of irgizites glass, high temperature and high speed of cooling.

It was proposed that the ferriferous and silicate-ferriferous inclusions are connected with an interaction between primary impact melt with the meteoritic iron. The guess is based on the presence of complicated inclusions characterized by ferriferous-silicate and silicate-ferriferous composition. The ferriferous-silicate inclusions, with size from 0.01 up to 0.1 mm, usually have the spherical shape, zone or spotty structure caused by the presence of the different color glass. The silicate-ferriferous isolations have both spherical, and disc-like. Their size varies from less than 0.01 till 0.05 mm. As a rule they contain a lot of ore material and small quantity of colorless and pink-grey glass.

The microprobe analysis has confirmed affinity of the studied samples to irgizites. The composition of samples: % - SiO_2 - 75.530, TiO_2 - 0.750, Al_2O_3 - 9.880, FeO (all Fe) - 5.870, MgO - 2.900, CaO - 2.050, Na_2O - 0.480, NiO - 0.122, total - 99.822.

The investigation with a method of local Raman and IR-spectroscopy allows to make a conclusion that the anionic structure of irgizites is homogeneous and high polymeric. Structural unit with one non bridging oxygen atom are insignificantly spread and uniformly distributed in glass structure. Hence, irgizites melt existed for a long time that promoted a homogenization of its chemical composition and structure.

The study is supported by RFBR (grants \acute{z} 04-05-97070- \grave{a} and \acute{z} 06-05-64173- \grave{a}).