MICROXENOLITE IN GAO-GUENIE METEORITE (H5)

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The Gao-Guenie meteorite fell as a meteor shower in West Africa in Burkina Faso on March 5, 1960. The fragmentsof this meteorite continue to be found in the desert at present [3]. We studied a small fragment of the Gao-Guenie meteorite weighing 1.35 g., sent to us for research by private collectors. To study the meteorite structure , a transparent polished section measuring 0.8 cm^2 was made.

The meteorite is an ordinary chondrites (H5) [1-2,4-5]. The studied fragment of the meteorite bears traces of impact force in the form of thin shock-melt veins. According to [6], the shock stage is S3. The fragment of the meteorite suffered insignificant weathering in the earth's conditions of W1 by [7].

A microxenolite measuring 0.4 * 1.0 mm was found during the studies of the section under transmitted light and was then studied using a scanning electron microscope JSM 6390LV (Jeol) with EDS X-max 80 at the Common Use Center of the UB RAS "Geoanalyst" (Ekaterinburg, Russia).

The microxenolite has a fragmental form. It is distinguished from the surrounding matrix minerals and chondrules by its internal structure and mineral composition, primarily the fine-grained structure and the distribution of the merrillite.

Microxenolite is composed of olivine (Fa 0.18-0.21), orthopyroxene (Fs 0.16-0.17), clinopyroxene (f 0.12-0.16) and mesostasis. Rare grains of merrillite, kamacite (Ni 5.5 wt%) and chromite are also found. Chromite has a composition of SiO_2 0.8 wt%, TiO_2 1.2 wt%, Al_2O_3 7.2 wt%, Cr_2O_3 55.1 wt%, FeO 31.3 wt%, MnO 1.1 wt%, MgO 2.4 wt%, and V_2O_3 0.9 wt%. Microxenolite has an extremely fine-grained structure, and the size of some individual minerals is 5-40 microns.

A crack passes through the centre of the xenolite, along which secondary iron hydroxides have developed. This was probably formed by weathering on earth. The gross composition of the xenolite is measured from two sides of this crack via the method of accumulating energy-dispersive spectra from an arbitrary region. The average gross composition of the xenolith according to the two given spectra of SiO_2 is 38.5 wt%, Al_2O_3 3.3 wt%, Cr_2O_3 0.9 wt%, FeO 19.6 wt%, MnO 0.4 wt%, MgO 31.0 wt%, CaO 1.4 wt% Na_2O 1.2 wt%, K_2O 0.1 wt%, P_2O_5 0.1 wt%, S 1.0 wt% and NiO 1.1 wt%.

According to the preliminary data, the microxenolite is a fragment of unclassified chondrite. Its classification is complicated by its small dimensions and superimposed thermal metamorphism in the bowels of the parent body of the Gao-Guenie meteorite. This is the first xenolith found in the Gao-Geni meteorite. A number of other H-chondrites are known for the discovery of xenoliths, mainly classified as fragments of carbonaceous chondrites [3].

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