SEM-STUDY OF A MINERAL GRAIN SURFACE IN PALLASITES. I.V. Kvasnytsya and V.P. Semenenko. Institute of Environmental Geochemistry, NAS of Ukraine, Palladina 34a, Kyiv-142, 03180 Ukraine.

Scanning electron microscopy (SEM) study of chondrites [1, 2, 5] has shown that a surface of mineral grains is very sensitive to physicochemical conditions of their origin and evolution. Surface of mineral grains and chondrules exhibits sculptural features, which are classified according to their nature as primary and secondary. In contrast to chondrites, SEM data on the morphological features of minerals from differentiated meteorites are scanty.

Here, the results of SEM investigation of sculptural features of mineral grains from the pallasites Omolon, Brahin and Krasnoiarsk are originally presented. The studied objects include of 40-50 grains of olivine and 30-35 grains of metal from each pallasite, and rare grains of chromite and shreibersite. The grains are characterized by a smooth, ribbed and fine-grained surface.

The following primary sculptures are found on a surface of olivine and metal grains: 1) inclusions of chromite crystals and their imprints (chiefly on the metal) and a native copper (on the olivine); pores. Formation of these sculptures results from a self-rectification from Cr and Cu of the metal and olivine during a slow cooling of a pallasite parent body. The presence of small spherical pores on the surface of the minerals attests probably some gas inclusions; 2) growth steps; rare polygonal faces and their embryous on the rounded grains of olivine.

Secondary sculptures, which were formed mainly in result of shock metamorphism, are presented as the next features: voids, friable (fracturing, disruption, brecciation) and plastic (linear, ribbed, wedge-shaped, lamellar, bending) deformations, sculptures of shock heating (recrystallization, sticked both sparks of melt and products of condensation). The surface of the minerals reveals the evidences of terrestrial weathering. Iron hydrooxides are present both as open-worked films on the olivine and fibrous rosettes on the metal grains.

The presence of magnetite euhedral crystals and their globules, which precipitated on a surface of deformed olivine from Brahin is one of the most interesting sculptural features. The magnetite crystals and globules belong to condensates formed the most probably in result of shock, which caused evaporation of the pallasite metal or troilite and following precipitation. Similar magnetite crystals from carbonaceous chondrites [6] were considered as condensates of the solar nebular [3] or as products of aqueous alteration on the chondrite parent body [4].

A pollen, which has been found in the pallasite Omolon, testifies to easiness of contamination of meteorites by a terrestrial organic material. EDS study reveals that the pollen has selectively adsorbed only microcrystals of feldspar – orthoclase and albite, and may be classified as a biological separator of minerals.

Conclusion. A surface of mineral grains from the pallasites displays a lot sculptures, which result essentially from a slow cooling of the pallasites parent body and a following shock metamorphism. The secondary sculptures are more widespread than the primary one's corresponding to those in chondrites. Variety of primary sculptures is narrower in the pallasites than in unequilibrated chondrites.

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