AMPHIBOLE SKARN-MAGNETITE DEPOSITS SHOHKADAMBULAK (KARAMAZAR, NORTHERN TAJIKISTAN)

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Skarn-magnetite deposits Shohkadambulak is located in the western part of Karamazar and is timed for the granodiorite contact with carbonate rocks of the D_3-C_1 age [5]. The skarns are composed mostly of magnetite, garnet and pyroxene, are bearing also polymetallic (Nasledovsky site) and cobalt mineralization [1, 2]. More than 80 mineral species and varieties, including rare ones such as freibergit, bornite, covelline, argentite, molybdenite, bismuthinite, cobaltite, cosalite, gelenobismutit, kobellit, datolite, ilvaite, ferropirosmalit, ferroaktinolit etc. are under the description here. Amphibole mineralization has significant spread in skarns development zones and is represented mainly by actinolite, and, to a lesser extent, by tremolite.

Actinolite in the degree of prevalence among non-metallic minerals of deposit occupies one of the leading places. It composes large lenticular bodies several meters thick on the field, extending for tens of meters, and nests among the calcareous skarns. The mineral is represented by large needle and columnar individuals collected in the radiating and sheaf-like aggregates. The length of individuals is ranging from 1-3 to 5-10 cm [4].

Actinolite is in close association with epidote, garnet, magnetite and apatite, as well quartz and calcite (fig.).

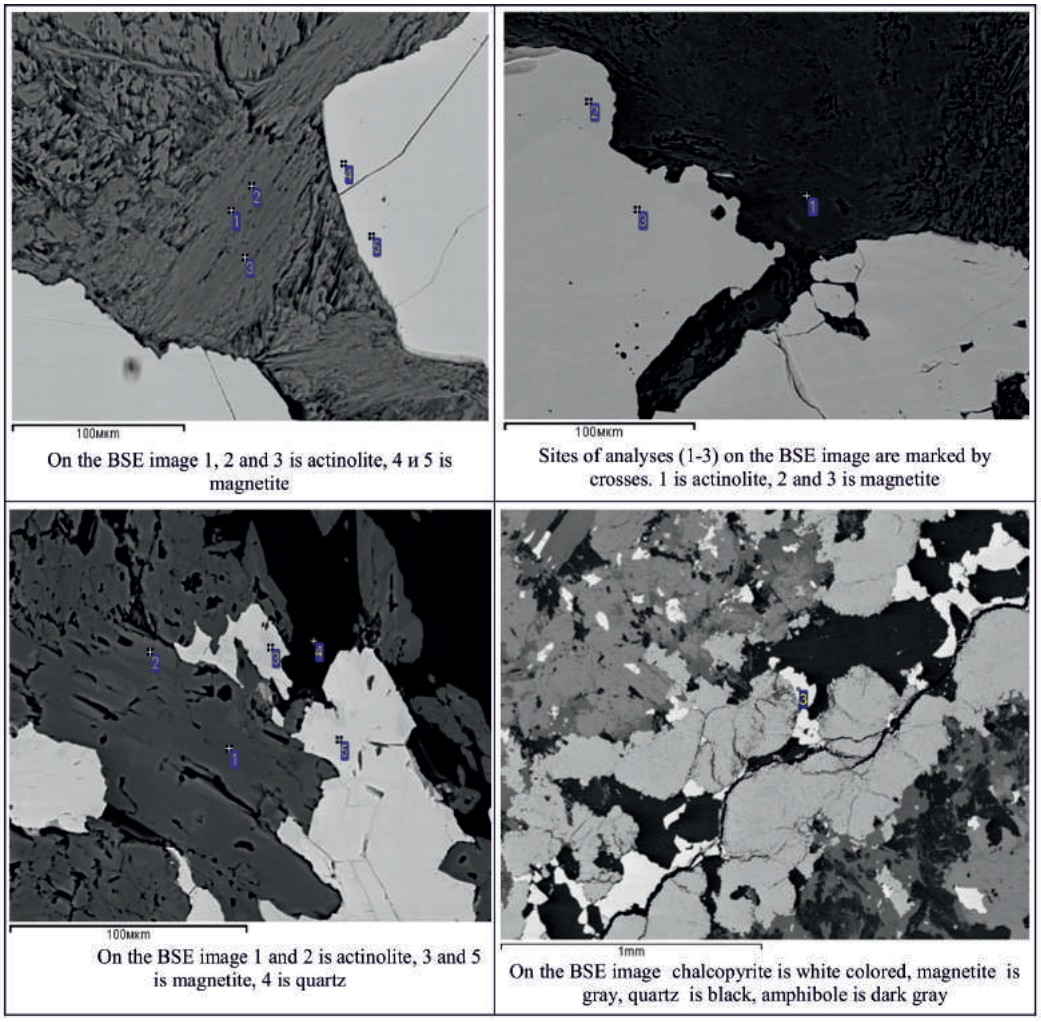

Fig. Electronic actinolite's image in BSE mode

In the macroscopic study the following species were identified: 1) fibrous aggregates, 2) granular monomineral veins with grain sizes from 0.6 to 1.6 mm, 3) symmetrical veins in association with quartz. In addition, among the radiant clusters there the fine-, medium- and coarse-grained mineral aggregates have been observed. They compose the bulk of aposkarn formations and contain the magnetite inside. Large monomineral symmetric and asymmetric actinolite veins are located in the outer zones, on the contact with the granitoids and epidosites and do not carry the mineralization. Fan-shaped sheaf-like accumulations of the mineral are observed in the carbonate. In some places there are sporadically relics

found of pyroxene in the central part of the grain.

Actinolite is in close germination with high temperature secondary quartz. Thin germination with each other shows their almost simultaneous formation.

For large elongated, radiant and sheaf-like aggregates of actinolite of the field Shohkadambulak there the specific sharp pleochroism is characteristic (Ng <Np). There is a reverse scheme absorption observed. Under crossed Nicols a high interference color is observed. The lengthening is positive. The columnar crystal of actinolite having low interference colors is met rarely.

The relationship of actinolite with other minerals is shown in the figure. As can be seen, it crosses the magnetite mass. Actinolite frequently corrodes and replaces the magnetite and quartz, and is therefore a later mineral.

The chemical composition (table) of the mineral has been identified on the micro analyzer Superprobe JCXA-733 Jeol Superprobe with energy dispersive spectrometer INCA Oxford in the mineralogical museum named after A.E. Fersman of the RAS (analyst Pautov L.A.).

Table

The results of microprobe analysis Actinolite, %
Processing parameters: Oxygen stoichiometry

Spectrum	MgO	Al_2O3	SiO_2	CaO	MnO	FeO	Total
1	11,78	1,18	51,25	12,26	1,64	15,51	93,63
2	10,98	0,97	50,31	11,84	2,43	15,86	92,40
3	13,64	2,63	51,01	12,57	1,25	13,51	94,62
1	13,07	1,14	50,39	11,94	1,27	12,91	90,71
1	13,63	2,24	51,74	12,63	-	14,80	95,04
2	10,73	2,36	49,95	12,34	0,34	19,21	94,92

Analyses show that the chemical composition of the mineral of Shohkadambulak (average of 6 tests, in %: SiO_2 - 50.77, Al_2O_3 - 1.75, MgO - 6.12, FeO - 15.28, CaO - 12.26, MnO - 1.55) is closest to actinolite of Loch-Gair (Scotland) according U.A. Deere et al. [4]. However, it is less in the amount of MgO (6.12 vs. 12.91%), but larger than of CaO (12.26 vs. 10.96%). There is relatively lower the average content of FeO (15.28 vs. 17.81%) in actinolite from Shohkadambulak.

Tremolite in skarns forms dense finely crystalline differences, stacked by randomly oriented columnar individuals with rhombic cross-sections, with platelets collected in the radiating sheaf-like aggregates and fibrous varieties. The size of individuals is usually a few hundredths of a millimeter, it is rare to 1-2 mm. The mineral is of white, grayish-white and light green color. Shine is silky.

Amphiboles in the skarn-magnetite deposit Shohkadambulak are presented by tremolite-actinolite difference. With respect to the magnetite mineralization the amphibole is later and its chemical composition is close to the theoretical composition of actinolite.

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