GEIKIELITE FROM MOUNT JEMORAKLY-TUBE, NORTH CAUCASUS, U.S.S.R.

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INTRODUCTION

The investigation which led to the description of this rather rare mineral was initiated through a suggestion of Professor V. I. Kryzanovsky, Director of the Mineralogical Museum of the Academy of Sciences of the U.S.S.R., to whom the writer showed some grains of the mineral included in a purple chromian chlorite. A microchemical test by Prof. Kryzanovsky suggested that the mineral probably belonged to the ilmenite group, and might be the magnesian member, geikielite.

OCCURRENCE

In the North Caucasus Mountains are found very extensive outcrops of serpentinite intrusions along the upper course of the Kefar-Agur River in the Great Zelenchuk Basin. The highest peak (9,000 ft.) in the region, Mount Jemorakly-Tube, is composed entirely of serpentinites. Microscopic study shows that the parent rocks of these serpentinites were lherzolites, saxonites, and, to a lesser extent, dunites.

Ore bodies of chrome-spinels, magnetite, and spinel crop out in this region. Analyses of the chrome-spinels indicate material of medium grade, containing from 45.07–54% Cr_2O_3. The ore bodies occur mainly in the immediate vicinity of Mount Jemorakly-Tube. The main chromite deposit lies on the western slope of a ridge forming the watershed between the Kefar-Agur and Kefar Rivers, at the juncture of this ridge and the north side of Mount Jemorakly-Tube. Here chromite deposits occur as uncommon lenses in a tabular, completely serpentinized body of dunite. The main deposit, which crops out over a length of several meters, is covered by a very thick mass of talus blocks.

Fractures in the chromite ores have been filled with green and purple chromian chlorites. In these the writer found several large pieces of these chlorites with rare inclusions of the then unknown mineral, now identified as geikielite. Another occurrence of geikielite in the U.S.S.R. was established by Kashin (1937), who found it in association with chlorites in the chrome-spinel deposits of the Camel Mountains, in the Southern Urals.

DESCRIPTION

The mineral is imbedded in a matrix of chromian chlorites and forms prismatic crystals as much as 6–7 mm. in diameter. The fracture is conchoidal. The mineral is not magnetic. It is black and lustrous with a

purplish-brown streak; H = 5; G = 4.1; it is slowly soluble in HCl. In thin section it is translucent and purplish-red in color. It is uniaxial negative with $\omega = 2.35$, $\epsilon = 1.98$; absorption weak $\omega < \epsilon$.

The results of the chemical analysis performed in the Geochemical Laboratory of the Institute of Applied Chemistry, Rostov on Don, is given in Table 1, column 1. A comparison of the composition of this mineral with that from the Camel Mountains chromium spinelid deposits in the Southern Urals and with magnesian spinels from Ceylon is also given in Table 1.

The approximate empirical formula of the Caucasus geikielite may be written as (Mg, Fe, Mn)TiO_3. The composition may be expressed in terms of the three end-member molecules: geikielite ($MgTiO_3$), crichtonite ($FeTiO_3$), and pyrophanite ($MnTiO_3$). The ratio of these molecules is $MgTiO_3 : FeTiO_3 : MnTiO_3 = 31 : 10 : 1$.

TABLE 1. ANALYSES OF GEIKIELITE

	1	2	3	4	5	6
SiO_2	0.85	0.014	1.02	0.016	—	—
TiO_2	57.52	0.720	58.24	0.728	63.94	61.32
Al_2O_3	1.22	0.012	1.04	0.010	—	—
Cr_2O_3	0.65	0.004	0.15	—	—	—
Fe_2O_3	2.82	0.017	4.05	0.025	0.25	2.03
FeO	12.30	0.171	14.96	0.208	10.09	7.75
NiO	0.27	0.003	—	—	—	—
MgO	21.57	0.539	20.36	0.501	25.79	28.95
MnO	1.27	0.017	0.24	0.003	—	—
CaO	0.32	0.05	none	—	—	—
V_2O_5	0.25	—	traces	—	—	—
P_2O_5	0.17	0.001	—	—	—	—
CO_2	0.45	0.010	—	—	—	—
H_2O	0.17	0.009	—	—	—	—
Total	99.83		100.06		100.07	100.05

1. Geikielite from Mount Jemorakly-Tube, North Caucasus, USSR. *Analyst* Fanny Cantor.
3. Geikielite from the Camel Mountains, Southern Urals, USSR. (Kashin, 1937); 5 and 6 geikielites from Ceylon (Doelter).

REFERENCES

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3. KASHIN, S. A., Metamorphism of chromspinelids in the Camel Mountains (Southern Urals): Chromites of the U.S.S.R., *Acad. Sci. U.S.S.R.* (1937).