

Crystal Data: Triclinic. *Point Group:* $\bar{1}$. As prismatic to thick tabular crystals, to 100 μm .

Physical Properties: *Cleavage:* None. *Fracture:* Uneven. *Tenacity:* Brittle. Hardness = ~ 5 VHN = 412-588 (50 g load). *D(meas.)* = n.d. *D(calc.)* = 3.67

Optical Properties: Opaque. *Color:* Black, gray with weak deep red internal reflections in reflected light. *Streak:* Reddish brown. *Luster:* Semi-metallic. *Anisotropism:* Weak. *Optical Class:* n.d.

R_1 - R_2 : (470) 14.4-16.4, (546) 13.2-15.5, (589) 13.0-14.9, (650) 12.7-14.1

Cell Data: *Space Group:* $P\bar{1}$. $a = 8.0217(5)$ $b = 9.6858(10)$ $c = 6.5475(9)$
 $\alpha = 103.645(10)^\circ$ $\beta = 102.369(8)^\circ$ $\gamma = 106.281(8)^\circ$ $Z = 1$

X-ray Powder Pattern: Tolbachik volcano, Kamchatka Peninsula, Russia.

3.141 (100), 3.044 (92), 4.718 (29), 7.36 (27), 3.671 (26), 2.811 (26), 4.417 (24)

Chemistry:	(1)	(2)
MgO	2.78	
CaO	0.95	
MnO	0.04	
CuO	17.70	22.82
ZnO	0.14	
Al_2O_3	11.76	9.75
Fe_2O_3	10.10	15.27
TiO_2	1.47	
P_2O_5	0.13	
V_2O_5	54.97	52.16
Total	100.04	100.00

(1) Tolbachik volcano, Russia; average of 5 electron microprobe analyses; corresponding to $\text{Ca}_{0.17}\text{Mg}_{0.69}\text{Mn}_{0.01}\text{Cu}_{2.23}\text{Zn}_{0.02}\text{Al}_{2.31}\text{Fe}^{3+}_{1.27}\text{Ti}_{0.18}\text{P}_{0.02}\text{V}_{6.05}\text{O}_{24}$. (2) $\text{Cu}_3\text{Fe}_2^{3+}\text{Al}_2(\text{VO}_4)_6$.

Mineral Group: Howardevansite group.

Occurrence: A sublimate on basaltic scoria deposited from fumarolic gas.

Association: Hematite, bannermanite, ziesite.

Distribution: From the apical part of the Second scoria cone, Northern Breakthrough of the Great Tolbachik Fissure Eruption, Tolbachik volcano, Kamchatka Peninsula, Russia.

Name: Honors Professor Dmitry Pavlovich Grigoriev (1909-2003), Saint Petersburg Mining Institute, Russia, for his contributions to the mineralogical sciences.

Type Material: A.E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, Russia (# 49123).

References: (1) Pekov I.V., N.V. Zubkova, V.O. Yapaskurt, P.M. Kartashov, Y.S. Polekhovsky, M.N. Murashko, and D.Y. Pushcharovsky (2014) Koksharovite, $\text{CaMg}_2\text{Fe}_4^{3+}(\text{VO}_4)_6$, and grigorievite, $\text{Cu}_3\text{Fe}_2^{3+}\text{Al}_2(\text{VO}_4)_6$, two new howardevansite-group minerals from volcanic exhalations. *European Journal of Mineralogy*, 26(5), 667-677. (2) (2015) *Amer. Mineral.*, 100, 660-661 (abs. ref. 1).