

Kapustinite

Crystal Data: Monoclinic. *Point Group:* 2/m. As equant grains to 4 cm; in clusters to 8 cm.

Physical Properties: *Cleavage:* None. *Fracture:* Conchoidal. *Tenacity:* Brittle.
Hardness = 6 D(meas.) = 2.78(1) D(calc.) = 2.815

Optical Properties: Transparent to translucent. *Color:* Dark cherry-red. *Streak:* Pale lilac.
Luster: Vitreous.
Optical Class: Biaxial (-). $\alpha = 1.585(2)$ $\beta = \gamma = 1.589(2)$ $2V(\text{meas}) = <5^\circ$ $2V(\text{calc}) = 0^\circ$
Dispersion: None. *Pleochroism:* None.

Cell Data: *Space Group:* C2/m. $a = 10.693(4)$ $b = 10.299(4)$ $c = 7.373(4)$ $\beta = 91.91(5)^\circ$ $Z = 2$

X-ray Powder Pattern: Kedykverpakhk Mountain, Kola Peninsula, Russia.
2.651 (100), 3.270 (92), 2.580 (91), 3.342 (84), 5.313 (51), 3.690 (43), 1.849 (39)

Chemistry:	(1)		(1)
Na ₂ O	24.42	Ce ₂ O ₃	0.20
K ₂ O	0.02	Nd ₂ O ₃	0.24
MgO	0.02	SiO ₂	52.82
CaO	0.18	TiO ₂	0.54
MnO	2.36	ZrO ₂	16.38
ZnO	0.05	UO ₂	0.28
Fe ₂ O ₃	0.36	<u>H₂O</u>	<u>2.80</u>
Y ₂ O ₃	0.17	Total	100.84

(1) Kedykverpakhk Mountain, Kola Peninsula, Russia; electron microprobe analysis, H₂O by Penfield method, corresponding to Na_{5.38}Y_{0.01}Ce_{0.01}Nd_{0.01}U_{0.01}Ca_{0.02}Mn_{0.23}Fe_{0.03}Ti_{0.05}Zr_{0.91}Si₆O_{15.91}(OH)_{2.12}.

Mineral Group: Lovozerite group, zirsinalite-lovozerite subgroup.

Occurrence: In hyperagpaitic pegmatite in an alkaline massif.

Association: Microcline, aegirine, kazakovite, ussingite, sodalite, analcime, natrosilite, villiaumite.

Distribution: From the Palitra pegmatite, Kedykverpakhk Mountain, Lovozero alkaline massif, Kola Peninsula, Russia.

Name: Honors mineralogist Yu. L. Kapustin (1933–2002), who extensively studied alkaline massifs.

Type Material: A.E. Fersman Mineralogical Museum, Moscow, Russia.

References: (1) Pekov, I.V., N.V. Chukanov, N.A. Yamnova, Yu.K. Egorov-Tismenko, and A.E. Zadov (2003) Kapustinite, Na_{5.5}Mn_{0.25}ZrSi₆O₁₆(OH)₂, a new mineral from the Lovozero massif (Kola Peninsula) and new data on the genetic crystallochemistry of the Lovozerite group. *Zapiski Vseross. Mineral. Obshch.*, 132(6), 1–14 (in Russian, English abs.). (2) Yamnova, N.A., Yu.K. Egorov-Tismenko, I.V. Pekov, and L.V. Shchegol'kova (2004) Crystal structure of kapustinite Na_{5.5}Mn_{0.25}Zr[Si₆O₁₆(OH)₂], a new mineral of the lovozerite group. *Doklady Akad. Nauk*, 396, 680–685 (in Russian). (3) (2005) *Amer. Mineral.*, 90, 271–272 (abs. refs. 1 & 2). (4) Pekov, I.V., S.V. Krivovichev, A.A. Zolotarev, V.N. Yakovenchuk, T. Armbruster and Y.A. Pakhomovsky (2009) Crystal chemistry and nomenclature of the lovozerite group. *Eur. J. Mineral.*, 21, 1061–1071.