

Mendeleevite-(Nd) $(\text{Cs}, \square)_6(\square, \text{Cs})_6(\square, \text{K})_6(\text{REE}, \text{Ca})_{30}(\text{Si}_{70}\text{O}_{175})(\text{OH}, \text{H}_2\text{O}, \text{F})_{35}$

Crystal Data: Cubic. *Point Group:* $2/m\bar{3}$. As cubic crystals to 40 μm .

Physical Properties: *Cleavage:* None. *Tenacity:* Brittle. *Fracture:* Conchoidal.
Hardness = 5-5.5 VHN = 621 (50 g load). $D(\text{meas.}) = 3.20(2)$ $D(\text{calc.}) = 3.155$

Optical Properties: Transparent. *Color:* Colorless, sometimes with a pale brown hue.
Streak: White. *Luster:* Vitreous.
Optical Class: Isotropic. $n = 1.582(2)$

Cell Data: Space Group: $Pm\bar{3}$. $a = 21.9106(4)$ $Z = 2$

X-ray Powder Pattern: Upper Darai-Pioz alkaline massif, Alaisky mountain ridge, Tajikistan.
11.01 (100), 15.63 (55), 3.47 (42), 3.099 (42), 2.192 (42), 1.819 (41), 12.73 (40)

Chemistry:	(1)		(1)
SiO ₂	42.30	SrO	2.99
Gd ₂ O ₃	1.69	CaO	2.20
Eu ₂ O ₃	0.47	Cs ₂ O	8.50
Sm ₂ O ₃	4.19	K ₂ O	0.85
Nd ₂ O ₃	16.19	F	1.25
Pr ₂ O ₃	2.79	H ₂ O	[3.85]
Ce ₂ O ₃	10.12	$\frac{-\text{O}=\text{F}_2}{\text{Total}}$	$\frac{0.53}{100.46}$
La ₂ O ₃	3.60		

(1) Upper Darai-Pioz alkaline massif, Alaisky mountain ridge, Tajikistan; average of 12 electron microprobe analyses supplemented by IR spectroscopy, H₂O calculated by analogy to mendeleevite-(Ce); corresponds to $\text{Cs}_6(\square_{4.20}\text{K}_{1.80})_{\Sigma=6.00}\{[(\text{Nd}_{9.57}\text{Ce}_{6.13}\text{Sm}_{2.39}\text{La}_{2.20}\text{Pr}_{1.68}\text{Gd}_{0.93}\text{Eu}_{0.27})_{\Sigma=23.17}(\text{Ca}_{3.90}\text{Sr}_{2.87})_{\Sigma=6.77}]_{\Sigma=29.94}\square_{0.06}\}_{\Sigma=30}(\text{Si}_{70.03}\text{O}_{175})((\text{OH})_{14.47}\text{F}_{6.54})_{\Sigma=21.01}(\text{H}_2\text{O})_{14}$.

Occurrence: In a pectolite aggregate in quartz-rich rock associated with a complex alkaline massif.

Association: Pectolite, quartz, aegirine, fluorite, khvorovite, mendeleevite-(Ce), sokolovaite, hyalotekite, orlovite, kirchhoffite, pekovite, neptunite, zeravshanite, senkevichite, nordite-(Ce), alamosite, pyrochlore-group minerals, baratovite.

Distribution: From the upper Darai-Pioz alkaline massif, in the moraine of the Darai-Pioz glacier in the upper reaches of the Darai-Pioz River, near the Alaisky mountain ridge, at the juncture of the Turkestan, Alay, and Zeravshan Ranges, Tajikistan.

Name: Honors Dmitri Mendeleev (1834-1907), the Russian chemist and author of the periodic table of the chemical elements. The suffix indicates the dominant rare earth element.

Type Material: A.E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, Russia (4707/1).

References: (1) Agakhanov, A.A., L.A. Pautov, E. Sokolova, F.C. Hawthorne, V.Yu. Karpenko, O.I. Siidra, and V.K. Garanin (2017) Mendeleevite-(Nd), $(\text{Cs}, \square)_6(\square, \text{Cs})_6(\square, \text{K})_6(\text{REE}, \text{Ca})_{30}(\text{Si}_{70}\text{O}_{175})(\text{OH}, \text{H}_2\text{O}, \text{F})_{35}$, a new mineral from the Darai-Pioz alkaline massif, Tajikistan. *Mineral. Mag.*, 81(1), 135-141. (2) (2017) *Amer. Mineral.*, 102, 1147 (abs. ref. 1).