Mendeleevite-(Nd) $(Cs,\square)_6(\square,Cs)_6(\square,K)_6(REE,Ca)_{30}(Si_{70}O_{175})(OH,H_2O,F)_{35}$

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(meas.) = 3.20(2) D(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_2O_3	1.69	CaO	2.20
Eu_2O_3	0.47	Cs_2O	8.50
Sm_2O_3	4.19	K_2O	0.85
Nd_2O_3	16.19	F	1.25
Pr_2O_3	2.79	H_2O	[3.85]
Ce_2O_3	10.12	$-O = F_2$	0.53
La_2O_3	3.60	Total	100.46

(1) Upper Darai-Pioz alkaline massif, Alaisky mountain ridge, Tajikistan; average of 12 electron microprobe analyses supplemented by IR spectroscopy, H_2O calculated by analogy to mendeleevite-(Ce); corresponds to $Cs_6(\square_{4.20}K_{1.80})_{\Sigma=6.00}\{[(Nd_{9.57}Ce_{6.13}Sm_{2.39}La_{2.20}Pr_{1.68}Gd_{0.93}Eu_{0.27})_{\Sigma=23.17}(Ca_{3.90}Sr_{2.87})_{\Sigma=6.77}]_{\Sigma=29.94}\square_{0.06}\}_{\Sigma=30}(Si_{70.03}O_{175})((OH)_{14.47}F_{6.54})_{\Sigma=21.01}(H_2O)_{14}$.

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), $(Cs,\square)_6(\square,Cs)_6(\square,K)_6(REE,Ca)_{30}(Si_{70}O_{175})(OH,H_2O,F)_{35}$, 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).