

Crystal Data: Monoclinic. *Point Group:* 2/m. Crystals are doubly terminated, platy prismatic to a few tenths of a millimeter, elongate along [001], platy on {100}, showing {010}, {001}, {023}, {423}, and {210}; in crusts to 1.2 mm.

Physical Properties: *Cleavage:* Poor on {010}. *Tenacity:* Brittle. *Fracture:* Uneven. Hardness = 2.5-3 D(meas.) = 1.91(2) D(calc.) = 1.90

Optical Properties: Transparent. *Color:* Snow-white to colorless. *Streak:* White. *Luster:* Vitreous. *Optical Class:* Biaxial (-). $\alpha = 1.453(2)$ $\beta = 1.459(2)$ $\gamma = \text{n.d.}$ $2V = \text{n.d.}$ *Orientation:* $X \wedge c = 0-7^\circ$.

Cell Data: *Space Group:* P2₁/n. $a = 14.71(1)$ $b = 9.33(1)$ $c = 15.13(2)$ $\beta = 89.8(1)^\circ$ $Z = 4$

X-ray Powder Pattern: Kazennitsa pegmatite, Alabashka pegmatite field, Middle Urals, Russia. 7.36 (100), 6.95 (90), 10.50 (75), 3.316 (60), 2.889 (60), 3.162 (50), 2.391 (48)

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| Chemistry: | (1) |
| Na ₂ O | 14.80 |
| K ₂ O | 0.05 |
| CaO | 0.20 |
| MgO | 0.14 |
| MnO | 11.20 |
| FeO | 0.15 |
| P ₂ O ₅ | 35.23 |
| H ₂ O | [36.46] |
| Total | 98.23 |

(1) Kazennitsa pegmatite, Alabashka pegmatite field, Middle Urals, Russia; average electron microprobe analysis, H₂O calculated for the ideal formula; corresponds to (Mn_{0.95}Mg_{0.02}Fe_{0.01})_{Σ=0.98}(Na_{2.86}Ca_{0.02}K_{0.01})_{Σ=2.89}P_{2.98}O_{9.87}·12.13H₂O.

Occurrence: In the vuggy, microcline-albite-quartz-muscovite central zone of a granitic pegmatite vein.

Association: Quartz, topaz, cassiterite, coated by muscovite and stellerite.

Distribution: From the Kazennitsa pegmatite, Alabashka pegmatite field, Middle Urals, Russia.

Name: Honors mining historian Aleksandr *Kanonerov* Anatol'evich (1955-2003) of the Nizhnii Tagil Museum of Mining Industry of the Middle Urals, who first collected the mineral in 1995.

Type Material: Mineralogical Museum, Ilmen Natural Reserve, Miass, Russia (ms6160).

References: (1) Popova, V.I., V.A. Popov, E.V. Sokolova, G. Ferraris, and N.V. Chukanov (2002) Kanonerovite, MnNa₃P₃O₁₀·12H₂O, first triphosphate mineral (Kazennitsa pegmatite, Middle Urals, Russia). *Neues Jahrb. Mineral. Mon.*, 117-127. (2) (2002) *Amer. Mineral.*, 87, 1732 (abs. ref. 1). (3) Lightfoot, P. and A.K. Cheetham (1987) Structure of manganese(II) trisodium tripolyphosphate dodecahydrate. *Acta Crystal.*, C43, 4-7.