

# Sidorenkite

# $\text{Na}_3\text{Mn}^{2+}(\text{PO}_4)(\text{CO}_3)$

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**Crystal Data:** Monoclinic, pseudo-orthorhombic. *Point Group:*  $2/m$  or  $2$ . Crystals, elongated along [001], are boxlike, showing {100}, {010}, rarely {001}, to 3 cm; granular.

**Physical Properties:** *Cleavage:* On {100} and {010}, perfect; on {001}, imperfect. *Fracture:* Uneven. *Tenacity:* Brittle. Hardness =  $\sim 2$  D(meas.) = 2.90–3.03 D(calc.) = 2.98 Strongly electromagnetic.

**Optical Properties:** Transparent. *Color:* Colorless, pale rose-red to pale pink, with surficial brownish or yellowish tint. *Luster:* Vitreous, pearly on cleavages.

*Optical Class:* Biaxial (-). *Orientation:*  $X = b$ ;  $Y = c$ ;  $Z = a$ .  $\alpha = 1.521(2)$   $\beta = 1.563(2)$   $\gamma = 1.585(2)$   $2V(\text{meas.}) = 68^\circ$   $2V(\text{calc.}) = 70^\circ$

**Cell Data:** *Space Group:*  $P2_1/m$  or  $P2_1$ .  $a = 8.997(4)$   $b = 6.741(2)$   $c = 5.163(2)$   $\beta = 90.16(4)^\circ$   $Z = 2$

**X-ray Powder Pattern:** Mt. Alluaiv, Kola Peninsula, Russia. 3.36 (100), 8.97 (20), 1.682 (20), 2.69 (15), 2.99 (12), 2.243 (12), 2.58 (8)

Chemistry:	(1)	(2)
$\text{P}_2\text{O}_5$	25.77	25.45
$\text{CO}_2$	15.71	15.78
FeO	0.49	
MnO	22.40	25.44
MgO	0.00	
CaO	2.20	
$\text{Na}_2\text{O}$	32.36	33.33
$\text{K}_2\text{O}$	0.44	
Total	99.37	100.00

(1) Mt. Alluaiv, Kola Peninsula, Russia; corresponds to  $(\text{Na}_{2.93}\text{K}_{0.03})_{\Sigma=2.96}(\text{Mn}_{0.89}\text{Ca}_{0.11}\text{Fe}_{0.02})_{\Sigma=1.02}(\text{PO}_4)_{1.02}(\text{CO}_3)_{1.00}$ . (2)  $\text{Na}_3\text{Mn}(\text{PO}_4)(\text{CO}_3)$ .

**Occurrence:** A rare low-temperature hydrothermal mineral, formed very late in the crystallization of hyperagpaitic pegmatites in a differentiated alkalic massif (Mt. Alluaiv, Kola Peninsula, Russia); in sodalite syenite xenoliths associated with an intrusive alkalic gabbro-syenite complex (Mont Saint-Hilaire, Canada).

**Association:** Villiaumite, kogarkoite, thermonatrite, aegirine (Mt. Alluaiv, Kola Peninsula, Russia); rasvumite, ussingite, villiaumite (Mont Saint-Hilaire, Canada).

**Distribution:** From Mt. Alluaiv, Lovozero massif, and in the Khibiny massif, Kola Peninsula, Russia. On Mont Saint-Hilaire, Quebec, Canada.

**Name:** Honors Academician Aleksandr Vasil'evich Sidorenko (1917–1982), noted Russian geologist, a founder of the Kola Branch of the Russian Academy of Sciences.

**Type Material:** Geology Museum, Kola Branch, Academy of Sciences, Apatity, 5198; Mining Institute, St. Petersburg, 1110/1–2; Vernadsky Geological Museum, Moscow, 51718; A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 79775.

**References:** (1) Khomyakov, A.P., E.I. Semenov, M.E. Kazakova, and N.G. Shumyatskaya (1979) Sidorenkite,  $\text{Na}_3\text{Mn}(\text{PO}_4)(\text{CO}_3)$  – a new mineral. Zap. Vses. Mineral. Obshch., 108, 56–59 (in Russian). (2) (1979) Amer. Mineral., 64, 1332 (abs. ref. 1). (3) Kurova, T.A., N.G. Shumyatskaya, A.A. Voronkov, and Y.A. Pyatenko. (1980) Crystal structure of sidorenkite,  $\text{Na}_3\text{Mn}(\text{PO}_4)(\text{CO}_3)$ . Sov. Phys. Doklady Acad. Nauk SSSR, 25, 156–157 (in Russian).

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