Fedorovskite $Ca_2(Mg, Mn^{2+})_2B_4O_7(OH)_6$

Crystal Data: Orthorhombic. *Point Group:* $2/m\ 2/m\ 2/m$. As prismatic crystals, sometimes with rhombic outlines, to 1 cm; commonly in fibrous aggregates. *Twinning:* Polysynthetic, with {100} as composition plane.

Physical Properties: *Cleavage:* On {100}, perfect. Hardness = 4.5 D(meas.) = 2.65 D(calc.) = 2.60

Optical Properties: Semitransparent. *Color:* Brown. *Optical Class:* Biaxial (–). *Pleochroism:* X = colorless to pale yellow; Z = yellow to bright yellow. *Orientation:* $X = c$; $Z = a$. *Dispersion:* $r < v$, very strong. α = 1.619–1.623 β = 1.627–1.632 γ = 1.629–1.634 2V(meas.) = 48°

Cell Data: *Space Group: Pbam.* $a = 8.96(2)$ $b = 13.15(2)$ $c = 8.15(1)$ Z = [4]

X-ray Powder Pattern: Solongo deposit, Russia.
3.92 (10), 2.59 (10), 3.02 (7), 2.119 (7), 1.693 (7), 1.632 (7), 2.28 (6)

Chemistry:

	(1)	(2)
B_2O_3	35.4	33.42
FeO	1.3	
MnO	11.6	17.02
MgO	11.6	9.67
CaO	25.2	26.92
H_2O	n.d.	12.97
Total		100.00

(1) Solongo deposit, Russia; partial elemental analysis, here converted to oxides; corresponds to $Ca_2(Mg_{1.3}Mn_{0.7})_{\Sigma=2.0}B_4O_7(OH)_6$. (2) $Ca_2(Mg, Mn)_2B_4O_7(OH)_6$ with Mg:Mn = 1:1.

Polymorphism & Series: Forms a series with roweite.

Occurrence: In veinlets in a skarn-type boron deposit.

Association: Sakhaite, frolovite, uralborite, szaibélyite, datolite.

Distribution: From the Solongo boron deposit, Buryatia, Transbaikal region, Russia.

Name: Honors Nikolai Mikhailovich Fedorovskii (1886–1956), eminent crystallographer and founder of the Russian Research Institute of Mineral Resources, Moscow, Russia.

Type Material: Mineralogical Museum, St. Petersburg University, St. Petersburg, 1223/1; Il'menskii Preserve Museum, Miass, 4239; A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 76926, 77482, 77659.

References: (1) Malinko, S.V., D.P. Shashkin, and K.V. Yurkina (1977) Fedorovskite, a new boron mineral, and the isomorphous series roweite-fedorovskite. Zap. Vses. Mineral. Obshch., 105, 71–85. (2) (1977) Amer. Mineral., 62, 173 (abs. ref. 1).