

**Crystal Data:** Orthorhombic. *Point Group:*  $2/m\ 2/m\ 2/m$ . Lathlike crystals, to 5 mm, flattened on {100}, elongated and striated along [010], showing {001}, {100}, {021}, {201}, {401}, with rough {010}, {021} as terminations; compact massive.

**Physical Properties:** *Cleavage:* On {100}, fair; on {001}, {021}, poor. *Fracture:* Even to conchoidal. *Tenacity:* Brittle. Hardness = 4.5 D(meas.) = 2.935(5) D(calc.) = 2.939

**Optical Properties:** Transparent. *Color:* Pale brown; colorless in transmitted light. *Optical Class:* Biaxial (-). *Pleochroism:* Moderate; X = very pale brown to colorless; Y = pale amber; Z = yellowish brown. *Orientation:* X = c; Y = b; Z = a. *Dispersion:*  $r < v$ , strong. *Absorption:*  $X > Y > Z$ .  $\alpha = 1.631\text{--}1.648$   $\beta = 1.640\text{--}1.660$   $\gamma = 1.641\text{--}1.663$   $2V(\text{meas.}) = 15^\circ\text{--}28^\circ$

**Cell Data:** *Space Group:*  $Pbam$ .  $a = 8.27\text{--}8.289$   $b = 13.25\text{--}13.357$   $c = 9.01\text{--}9.057$   
Z = 4

**X-ray Powder Pattern:** Franklin, New Jersey, USA.  
3.974 (100), 2.600 (72), 2.184 (49), 2.128 (37), 2.264 (32), 1.708 (32), 1.641 (29)

Chemistry:	(1)	(2)	(3)		(1)	(2)	(3)
B <sub>2</sub> O <sub>3</sub>	32.40	30.2	34.15	ZnO	3.13		
SiO <sub>2</sub>			1.37	MgO	1.66		7.59
Fe <sub>2</sub> O <sub>3</sub>			0.13	CaO	25.40		23.96
FeO			1.20	H <sub>2</sub> O	8.51	11.9	13.40
MnO	28.30		17.87	insol.	0.84		
				Total	100.24		99.67

(1) Franklin, New Jersey, USA; corresponding to  $\text{Ca}_2(\text{Mn}_{1.67}\text{Mg}_{0.16}\text{Zn}_{0.06})_{\Sigma=1.89}\text{B}_4\text{O}_7(\text{OH})_6$ .

(2) Do.; partial analysis; by electron microprobe, B<sub>2</sub>O<sub>3</sub> on a separate sample, H<sub>2</sub>O by DTA-TGA; with cations stated to correspond to  $\text{Ca}_{1.91}(\text{Mn}_{1.89}\text{Mg}_{0.16}\text{Zn}_{0.04})_{\Sigma=2.09}\text{B}_4\text{O}_7(\text{OH})_6$ . (3) Solongo deposit, Russia; corresponding to  $\text{Ca}_{1.76}(\text{Mn}_{1.04}\text{Mg}_{0.78}\text{Fe}_{0.06}^{2+})_{\Sigma=1.88}\text{B}_{4.04}\text{O}_{6.67}(\text{OH})_{6.06}$ .

**Polymorphism & Series:** Forms a series with fedorovskite.

**Occurrence:** Very rare in hydrothermal veins in a metamorphosed stratiform zinc orebody (Franklin, New Jersey, USA).

**Association:** Clinochrysoile, calcite, franklinite, willemite, zincite (Franklin, New Jersey, USA).

**Distribution:** From Franklin, Sussex Co., New Jersey, USA. At the Solongo boron deposit, Buryatia, Russia.

**Name:** To honor George Rowe (1868–1947), Mine Captain at Franklin, New Jersey, USA, and long-time collector of Franklin minerals.

**Type Material:** National School of Mines, Paris, France; Harvard University, Cambridge, Massachusetts, 96252; National Museum of Natural History, Washington, D.C., USA, 105493, C6291.

**References:** (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 377–378. (2) Aristarain, L.F., R.C. Erd, and G.D. Eberlein (1974) Roweite from Franklin, New Jersey: a restudy. *Amer. Mineral.*, 59, 66–70. (3) Moore, P.B. and T. Araki (1974) Roweite,  $\text{Ca}_2\text{Mn}_2^{2+}(\text{OH})_4[\text{B}_4\text{O}_7(\text{OH})_2]$ : its atomic arrangement. *Amer. Mineral.*, 59, 60–65. (4) Malinko, S.V., T.I. Stolyarova, and D.P. Shashkin (1972) The first finding of magnesium roweite, its paragenesis and products of replacement. *Zap. Vses. Mineral. Obshch.*, 101, 465–473 (in Russian). (5) Yamnova, N.A., M.A. Simonov, and N.V. Belov (1975) Crystallochemical structure of roweite,  $\text{Ca}_2(\text{Mn}, \text{Mg})_2[\text{B}_4\text{O}_7(\text{OH})_2](\text{OH})_4$ . *Doklady Acad. Nauk SSSR*, 221, 1326–1329 (in Russian). (6) Dunn, P.J. (1995) Franklin and Sterling Hill, New Jersey. No publisher, n.p., 641–642.

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