

**Crystal Data:** Orthorhombic. *Point Group:*  $2/m\ 2/m\ 2/m$ . As elongated, euhedral to equant and anhedral grains to 0.5 mm; as lenticular to skeletal, rhombic prismatic needlelike crystals.

**Physical Properties:** *Cleavage:* None. Hardness =  $\sim 7$  D(meas.) = n.d. D(calc.) = 3.169

**Optical Properties:** Transparent. *Color:* Blue; blue in transmitted light. *Streak:* Pale blue. *Luster:* Vitreous.

*Optical Class:* Biaxial (-).  $\alpha = 1.631(1)$   $\beta = 1.654(1)$   $\gamma = 1.656(1)$   $2V_x(\text{meas.}) = 31.5(6)^\circ$   
*Pleochroism:*  $X = Z =$  pale blue-green,  $Y =$  colorless. *Dispersion:*  $v \gg r$ . *Orientation:*  $Y = c$  (prism elongation direction). Can have either positive or negative sign of elongation.

**Cell Data:** Space Group: *Pbnm*.  $a = 10.343(2)$   $b = 11.095(1)$   $c = 5.7601(8)$   $Z = 4$

**X-ray Powder Pattern:** Omine Mountains, Nara Prefecture, Japan.  
 5.21 (vs), 2.97 (s), 2.79 (s), 2.18 (s), 5.57 (m), 3.73 (m), 3.51 (m)

Chemistry:	(1)	(2)
SiO <sub>2</sub>	19.34	19.85
Al <sub>2</sub> O <sub>3</sub>	48.85	49.35
FeO	19.37	15.58
MnO	0.43	0.38
MgO	1.33	4.14
P <sub>2</sub> O <sub>5</sub>	0.13	0.01
<u>B<sub>2</sub>O<sub>3</sub></u>	<u>10.91</u>	<u>11.27</u>
Total	100.36	100.29

(1) Omine Mountains, Nara Prefecture, Japan; average of 5 electron microprobe analyses; corresponds to  $\text{Fe}_{0.85}\text{Mg}_{0.10}\text{Mn}_{0.02}\text{Al}_{3.01}\text{B}_{0.99}\text{P}_{0.01}\text{Si}_{1.01}\text{O}_9$ . (2) Horní Bory, Bory Massif, Czech Republic; electron microprobe analysis, total includes ZnO = 0.02; corresponds to  $\text{Fe}_{0.67}\text{Mg}_{0.32}\text{Mn}_{0.02}\text{Al}_{2.99}\text{B}_{1.00}\text{P}_{0.001}\text{Si}_{1.003}\text{O}_9$ .

**Polymorphism & Series:** Forms a continuous series with grandidierite.

**Occurrence:** In porphyritic granite and granodiorite (Japan); in borosilicate-bearing veinlets cutting leucogranulite (Czech Republic).

**Association:** Sekaninaite, garnet, biotite, andalusite, topaz, alkali feldspar, plagioclase, muscovite, quartz, dumortierite, schorl, zircon, ilmenite, apatite, monazite, pyrite (Japan); grandidierite, werdingite, boralsilite, K-feldspar, quartz, plagioclase (Czech Republic).

**Distribution:** From along the Misen River in Tenkawa, Yoshino, Omine Mountains, Nara Prefecture, Japan [TL]; at Horní Bory, Bory Massif, Bohemian Massif, Czech Republic.

**Name:** For the *Omine* Mountains, Japan, where the first specimens were collected.

**Type Material:** Department of Geology, National Science Museum, Tokyo, and Department of Earth Sciences, Chiba University, Chiba, Japan.

**References:** (1) Hiroi, Y., E.S. Grew, Y. Motoyoshi, D.R. Peacor, R.C. Rouse, S. Matsubara, K. Yokoyama, R. Miyawaki, J.J. McGee, S.-C. Su, T. Hokada, N. Furukawa, and H. Shibasaki (2001) Ominelite,  $(\text{Fe},\text{Mg})\text{Al}_3\text{BSiO}_9$  ( $\text{Fe}^{2+}$  analogue of grandidierite), a new mineral from porphyritic granite in Japan. *Amer. Mineral.*, 87, 160-170. (2) Cempírek, J., M. Novák, Z. Dolníček, J. Kotková, and R. Škoda (2010) Crystal chemistry and origin of grandidierite, ominelite, boralsilite, and werdingite from the Bory Granulite Massif, Czech Republic. *Amer. Mineral.*, 65, 1533-1547. (3) Dzikowski, T.J., L.A. Groat, and E.S. Grew (2007) The geometric effects of  ${}^V\text{Fe}^{2+}$  for  ${}^V\text{Mg}$  substitution on the crystal structures of the grandidierite-ominelite series. *Amer. Mineral.*, 92, 863-872.