

## Magnesio-hornblende



©2001 Mineral Data Publishing, version 1.2

**Crystal Data:** Monoclinic. *Point Group:* 2/m. As prismatic crystals; as reaction rims on pyroxenes. *Twinning:* Simple or lamellar twinning || {100}.

**Physical Properties:** *Cleavage:* Perfect on {110}, intersecting at 56° and 124°; partings on {100}, {010}. *Tenacity:* [Brittle.] *Hardness* = [5–6] *D*(meas.) = 3.10–3.28 *D*(calc.) = 3.26

**Optical Properties:** Semitransparent. *Color:* Green, brown. *Luster:* [Vitreous to pearly.] *Optical Class:* Biaxial (-). *Pleochroism:* X = yellow; Y = Z = green. *Orientation:* Y = b; Z ∧ c = 15°–19°. α = 1.675 β = 1.690 γ = 1.695 2V(meas.) = 56°

**Cell Data:** *Space Group:* C2/m. a = 9.887(2) b = 18.174(5) c = 5.308(5)  
β = 104° 58(2)' Z = 2

**X-ray Powder Pattern:** Sierra Nevada batholith, California, USA.

3.136 (100), 8.51 (56), 2.720 (33), 3.291 (26), 2.818 (19), 2.172 (19), 1.656 (18)

Chemistry:	(1)		(2)	
	(1)	(2)	(1)	(2)
SiO <sub>2</sub>	48.20	44.12	Na <sub>2</sub> O	1.96
TiO <sub>2</sub>	1.00	1.26	K <sub>2</sub> O	0.41
Al <sub>2</sub> O <sub>3</sub>	10.00	8.82	F	0.14
Fe <sub>2</sub> O <sub>3</sub>	3.50	5.53	Cl	0.07
FeO	10.60	14.77	H <sub>2</sub> O <sup>+</sup>	2.22
MnO	0.17	0.50	H <sub>2</sub> O <sup>-</sup>	0.45
MgO	10.06	9.19	-O = (F, Cl) <sub>2</sub>	0.08
CaO	10.59	11.74	Total	99.16
				99.92

(1) Sibukawa district, central Japan; corresponds to (Ca<sub>1.66</sub>Na<sub>0.55</sub>K<sub>0.08</sub>)<sub>Σ=2.29</sub>(Mg<sub>2.18</sub>Fe<sub>1.29</sub><sup>2+</sup>Fe<sub>0.39</sub><sup>3+</sup>Al<sub>0.76</sub>Ti<sub>0.10</sub>Mn<sub>0.02</sub>)<sub>Σ=4.74</sub>(Si<sub>7.04</sub>Al<sub>0.96</sub>)<sub>Σ=8.00</sub>[O<sub>21.84</sub>(OH)<sub>0.16</sub>]<sub>Σ=22.00</sub>(OH)<sub>2.00</sub>. (2) Sierra Nevada batholith, California, USA; corresponds to (Ca<sub>1.90</sub>Na<sub>0.35</sub>K<sub>0.17</sub>)<sub>Σ=2.42</sub>(Mg<sub>2.07</sub>Fe<sub>1.86</sub><sup>2+</sup>Fe<sub>0.63</sub><sup>3+</sup>Al<sub>0.23</sub>Ti<sub>0.14</sub>Mn<sub>0.06</sub>)<sub>Σ=4.99</sub>(Si<sub>6.66</sub>Al<sub>1.34</sub>)<sub>Σ=8.00</sub>O<sub>22</sub>[(OH)<sub>1.87</sub>F<sub>0.07</sub>Cl<sub>0.02</sub>]<sub>Σ=1.96</sub>.

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

**Mineral Group:** Amphibole (calcic) group: Mg/(Mg + Fe<sup>2+</sup>) ≥ 0.50; (Na + K)<sub>A</sub> < 0.5; Na<sub>B</sub> < 0.67; (Ca + Na)<sub>B</sub> ≥ 1.34; 6.50 Si 7.24.

**Occurrence:** Common in amphibolites, schists, and pegmatitic alkalic gabbro. Also from welded tuffs, granodiorites, granites, and tonalites.

**Association:** Quartz, orthoclase, plagioclase, biotite, magnetite, apatite (granite).

**Distribution:** Very widespread. A few confirmed localities include: at Vesuvius and Monte Somma, Campania, Italy. In the granitic batholiths of the Scottish Highlands; Swiss and Italian Alps; Harz Mountains, Germany; Finland and Sweden. In the Southern California and Sierra Nevada batholiths, California, USA. Widespread in Japan.

**Name:** For its high *magnesium* content and from the German for *horn* and *to deceive*, in allusion to its similarity to valuable minerals in ores.

**References:** (1) Dana, E.S. (1892) Dana's system of mineralogy, (6th edition), 385–398 [hornblende, in part]. (2) Dodge, F.C.W., J.J. Papike, and R.E. Mays (1968) Hornblendes from granitic rocks of the central Sierra Nevada batholith. *J. Petrol.*, 9, 378–410. (3) Leake, B.E. (1968) A catalog of analyzed calciferous and subcalciferous amphiboles together with their nomenclature and associated minerals. *Geol. Soc. Amer. Special Paper 98*, 210 p. [analysis 216].

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise without the prior written permission of Mineral Data Publishing.