

Ferrobustamite**Ca(Fe²⁺, Ca, Mn²⁺)Si₂O₆**

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Crystal Data: Triclinic. *Point Group:* $\bar{1}$. Crystalline, massive. *Twinning:* Simple twins on {100}.

Physical Properties: *Cleavage:* {100}, perfect; {110}, { $\bar{1}\bar{1}0$ }, good. Hardness = 6
D(meas.) = 3.09 D(calc.) = [3.09]

Optical Properties: Semitransparent. *Color:* Colorless, pink to brown.
Optical Class: Biaxial. *Orientation:* $X' \wedge c = 44^\circ$ in section perpendicular to the zone of cleavages. $\alpha = 1.640$ $\beta = \text{n.d.}$ $\gamma = 1.653$ $2V(\text{meas.}) = 60(3)^\circ$

Cell Data: *Space Group:* $A\bar{1}$. $a = 7.862$ $b = 7.253$ $c = 13.967$ $\alpha = 89^\circ 44'$ $\beta = 95^\circ 28'$
 $\gamma = 103^\circ 29'$ $Z = 6$

X-ray Powder Pattern: Kagata or Ofuku mine, Japan. (ICDD 29-336).
3.270 (100), 3.049 (80), 2.278 (65), 3.470 (60), 3.84 (55), 2.696 (30), 7.67 (25)

Chemistry:	(1)	(2)	(3)
SiO ₂	50.00	53.30	49.8
TiO ₂	trace		
Al ₂ O ₃			0.0
Fe ₂ O ₃	0.00		
FeO	9.29	10.44	9.0
MnO	1.22	1.58	1.6
MgO	0.00	0.06	0.1
CaO	38.86	34.63	38.9
H ₂ O	0.00		
insol.	0.45		
Total	99.82	100.01	99.4

(1) Isle of Skye, Scotland; corresponding to (Ca_{1.65}Fe_{0.31}Mn_{0.04})_{Σ=2.00}Si₂O₆. (2) Do.; by electron microprobe, corresponding to (Ca_{1.58}Fe_{0.38}Mn_{0.04})_{Σ=2.00}Si₂O₆. (3) Ofuku mine, Japan; by electron microprobe, corresponds to (Ca_{1.64}Fe_{0.30}Mn_{0.06})_{Σ=2.00}Si₂O₆.

Occurrence: Surrounding chert nodules in a skarn in dolostone (Isle of Skye, Scotland).

Association: Hedenbergite, grossular-andradite (Isle of Skye, Scotland).

Distribution: At Camas Malag, Isle of Skye, Scotland. From Scawt Hill, near Larne, Co. Antrim, Ireland. In the Kagata, Ofuku, and Ohta mines, Yamaguchi Prefecture; in the Kasugayama and Tsuchiarashi deposits, near Iida, Nagano Prefecture; on Kurodaké Peak, near Toyama, Yoyama Prefecture; in the Tsumo mine, Shimane Prefecture; in the Horado mine, Gifu Prefecture; and at a number of other localities in Japan. From the Wessels mine, near Kuruman, Cape Province, South Africa.

Name: For FERROan iron in its composition and its relation to *bustamite*.

Type Material: n.d.

References: (1) Deer, W.A., R.A. Howie, and J. Zussman (1978) Rock-forming minerals, (2nd edition), v. 2A, single-chain silicates, 575–585. (2) Tilley, C.E. (1948) On iron-wollastonites in contact-skarns: an example from Skye. *Amer. Mineral.*, 33, 736–738. (3) Rapoport, P.A. and C.W. Burnham (1973) Ferrobustamite: the crystal structures of two Ca,Fe bustamite-type pyroxenoids. *Zeits. Krist.*, 138, 419–438. (4) Shimazaki, H. and T. Yamanaka (1973) Iron-wollastonite from skarns and its stability relation in the CaSiO₃ – CaFeSi₂O₆ join. *Geochem. J.*, 7, 67–79. (5) Yamanaka, T., R. Sadanaga, and Y. Takéuchi (1977) Structural variation in the ferrobustamite solid solution. *Amer. Mineral.*, 62, 1216–1224. (6) Shimazaki, H. and M. Bunno (1978) Subsolidus skarn equilibria in the system CaSiO₃ – CaMgSi₂O₆ – CaFeSi₂O₆ – CaMnSi₂O₆. *Can. Mineral.*, 16, 539–545.

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