

Crystal Data: Hexagonal. *Point Group:* $\bar{3}2/m$ or 32. Platy crystals, flattened on {0001}, rhombohedral {10 $\bar{1}$ 1} with {0001}, {10 $\bar{1}$ 0}, {11 $\bar{2}$ 0}, to 2 mm; may be discoidal, corrugated granular.

Physical Properties: *Cleavage:* Good on {10 $\bar{1}$ 1}. *Fracture:* Hackly. Hardness = 3.5 D(meas.) = 3.837 D(calc.) = 3.840 May fluoresce dark red under UV.

Optical Properties: Transparent. *Color:* Colorless to milky white; colorless in transmitted light. *Luster:* Vitreous.

Optical Class: Uniaxial (-). $\omega = 1.694(1)$ $\epsilon = 1.519(1)$

Cell Data: *Space Group:* $R\bar{3}m$ or $R32$. $a = 5.020(5)$ $c = 16.75(2)$ $Z = 3$

X-ray Powder Pattern: Westvaco trona mine, Wyoming, USA.

3.015 (100), 3.860 (35), 2.656 (35), 2.512 (35), 2.104 (35), 1.931 (35), 1.864 (35)

Chemistry:	(1)	(2)	(3)	(1)	(2)	(3)
CO ₂	31.2	[31.33]	31.25	MgO	13.9	14.08
SiO ₂	0.3			CaO	0.5	0.16
FeO	0.4	0.61		BaO	52.9	53.76
ZnO		0.06		Na ₂ O	0.2	54.44
MnO	0.1			insol.	0.4	
				Total	99.9	[100.00]
						100.00

(1) Westvaco trona mine, Wyoming, USA; CO₂ by evolved gas analysis; after deduction of SiO₂ and Na₂O as impurities, corresponding to (Ba_{0.99}Ca_{0.01}) $_{\Sigma=1.00}$ (Mg_{0.97}Fe_{0.03}) $_{\Sigma=1.00}$ (CO₃)_{2.01}.

(2) Tapira, Brazil; by electron microprobe, average of 15 analyses, CO₂ by difference; corresponding to (Ba_{0.98}Ca_{0.01}Fe_{0.01}) $_{\Sigma=1.00}$ (Mg_{0.98}Fe_{0.02}) $_{\Sigma=1.00}$ (CO₃)₂. (3) BaMg(CO₃)₂.

Mineral Group: Dolomite group.

Occurrence: A rare authigenic mineral in and underlying the Green River Formation; a primary mineral in carbonatites; uncommon in metamorphosed hydrothermal mineral deposits.

Association: Shortite, labuntsovite, searlesite, northupite, loughlinite, barytocalcite, witherite, pyrite, quartz (Westvaco trona mine, Wyoming, USA).

Distribution: In the USA, in the Westvaco trona mine, about 30 km west of Green River, Sweetwater Co., Wyoming; and at Iron Hill, Gunnison Co., Colorado. In Canada, on the Rough claims, north of Sifton Pass, British Columbia; at the Chipman Lake carbonatite, 350 km northeast of Thunder Bay, Ontario; and in the Jason Pb–Zn deposits, Macmillan Pass, Yukon Territory. From the Tapira carbonatite, Minas Gerais, Brazil. At the Vuoriyarvi carbonatite complex, Kola Peninsula, Russia. From the Bayan Obo Fe–Nb–RE deposit, 130 km north of Baotou, Inner Mongolia, China. In the Foss deposits, Aberfeldy, Perthshire, Scotland. At Långban, Värmland, Sweden. In the Rosh Pinah Zn–Pb–Cu deposit, about 160 km southeast of Aus, Namibia.

Name: Honors Keith Norseth (1927–1991), American engineering geologist, Westvaco trona mine, Wyoming, USA, for his assistance in mineralogical studies.

Type Material: National Museum of Natural History, Washington, D.C., USA, 137148, 162606.

References: (1) Mrose, M.E., E.C.T. Chao, J.J. Fahey, and C. Milton (1961) Norsethite, BaMg(CO₃)₂, a new mineral from the Green River Formation, Wyoming. *Amer. Mineral.*, 46, 420–429. (2) Secco, L. and B. Lavina (1999) Crystal chemistry of two natural magmatic norsethites, BaMg(CO₃)₂, from an Mg-carbonatite of the alkaline carbonatitic complex of Tapira (SE Brazil). *Neues Jahrb. Mineral., Monatsh.*, 87–96.

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