

Crystal Data: Monoclinic. *Point Group:* 2/m. Platy rhombic to pseudo-hexagonal crystals, flattened on {100}, elongated along [010] or [001], showing large {100}, {001}, {110}, {011}, {111}, to 3 mm; as a post-mine mammillary coating. Contact twins common on {100}.

Physical Properties: *Cleavage:* Perfect on {100}; indistinct on {001}. *Fracture:* Uneven. *Tenacity:* Sectile, flexible, inelastic. Hardness = ~3 D(meas.) = 2.09(1) D(calc.) = 2.098 Slightly to moderately soluble in H₂O.

Optical Properties: Transparent. *Color:* Colorless to white; colorless in transmitted light. *Streak:* White. *Luster:* Subvitreous, pearly on cleavages. *Optical Class:* Biaxial (+). $\alpha = 1.500(3)$ $\beta = 1.520(2)$ $\gamma = 1.554(2)$ $2V(\text{meas.}) = \text{n.d.}$ $2V(\text{calc.}) = 76^\circ$ *Orientation:* $Y = b$; $X \wedge a = 29^\circ$; $Z \wedge c = -7^\circ$. *Dispersion:* $r > v$, weak.

Cell Data: *Space Group:* P2₁/a. $a = 14.56(5)$ $b = 8.016(20)$ $c = 9.838(20)$
 $\beta = 111^\circ 45'(10)'$ $Z = 4$

X-ray Powder Pattern: Near the De Bely mine, California, USA; strong preferred orientation due to platy {100} cleavage.

6.79 (100), 3.39 (31), 5.18 (9), 2.566 (9), 3.12 (7), 2.309 (7), 4.68 (5)

Chemistry:	(1)	(2)
B ₂ O ₃	60.80	61.98
Fe ₂ O ₃	0.15	
CaO	16.96	16.64
SrO	0.11	
Na ₂ O	0.26	
K ₂ O	0.06	
Li ₂ O	0.02	
H ₂ O ⁺	20.82	
H ₂ O ⁻	1.02	
H ₂ O		21.38
insol.	0.08	
Total	100.28	100.00

(1) Near the De Bely mine, California, USA; SrO and alkalis by flame photometry, H₂O by the Penfield method; corresponds to Ca_{1.01}B_{5.84}O₉(OH)₂•3H₂O. (2) CaB₆O₉(OH)₂•3H₂O.

Occurrence: Typically a recent incrustation produced by weathering of colemanite and priceite veins in altered olivine basalt and basaltic clastic rocks (near the De Bely mine, California, USA).

Association: Colemanite, meyerhofferite, gowerrite, ulexite, ginorite, sassolite, gypsum, manganese oxide (near the De Bely mine, California, USA).

Distribution: In the USA, in the Furnace Creek district, Death Valley, Inyo Co., California, from one km north-northwest of the De Bely mine, and several other places; coarsely crystalline in the Corkscrew mine. From the Sijes district, Salta Province, Argentina. From drill core at Piskanja, Jarandol basin, Serbia.

Name: To honor Dr. Levi Fatzinger Noble (1882-1965), geologist with the U.S. Geological Survey, who studied the Death Valley borate deposits.

Type Material: National Museum of Natural History, Washington, D.C., USA; 136416, 147960.

References: (1) Erd, R.C., J.F. McAllister, and A.C. Vlisidis (1961) Nobleite, another new hydrous calcium borate from the Death Valley region, California. *Amer. Mineral.*, 46, 560-571. (2) Karanović, L., A. Rosić, and D. Poleti (2004) Crystal structure of nobleite, Ca[B₆O₉(OH)₂]-3H₂O, from Jarandol (Serbia). *Eur. J. Mineral.* 16, 825-833. (3) (2005) *Amer. Mineral.*, 90, 772 (abs. ref. 2).