

Crystal Data: Triclinic. *Point Group:* $\bar{1}$. Rare as measurable crystals, which may have many forms; typically elongated to acicular along [001], to 5 cm, then forming fibrous cottonball-like masses; in compact parallel fibrous veins, and radiating and compact nodular groups. *Twinning:* Polysynthetic on {010} and {100}; possibly also on $\{340\}$, $\{2\bar{3}0\}$, and others.

Physical Properties: *Cleavage:* On {010}, perfect; on $\{1\bar{1}0\}$, good; on {110}, poor. *Fracture:* Uneven across fiber groups. *Tenacity:* Brittle. Hardness = 2.5 D(meas.) = 1.955 D(calc.) = 1.955 Slightly soluble in H₂O; parallel fibrous masses can act as fiber optical light pipes; may fluoresce yellow, greenish yellow, cream, white under SW and LW UV.

Optical Properties: Transparent to opaque. *Color:* Colorless; white in aggregates, gray if included with clays. *Luster:* Vitreous; silky or satiny in fibrous aggregates. *Optical Class:* Biaxial (+). *Orientation:* X (11.5°, 81°); Y (100°, 21.5°); Z (107°, 70°) [with *c* (0°, 0°) and *b** (0°, 90°) using (ϕ, ρ)]. $\alpha = 1.491\text{--}1.496$ $\beta = 1.504\text{--}1.506$ $\gamma = 1.519\text{--}1.520$ 2V(meas.) = 73°–78°

Cell Data: *Space Group:* $P\bar{1}$. $a = 8.816(3)$ $b = 12.870(7)$ $c = 6.678(1)$ $\alpha = 90.36(2)^\circ$ $\beta = 109.05(2)^\circ$ $\gamma = 104.98(4)^\circ$ $Z = 2$

X-ray Powder Pattern: Jenifer mine, Boron, California, USA. 12.2 (100), 7.75 (80), 6.00 (30), 4.16 (30), 8.03 (15), 4.33 (15), 3.10 (15b)

Chemistry:

	(1)	(2)
B ₂ O ₃	43.07	42.95
CaO	13.92	13.84
Na ₂ O	7.78	7.65
H ₂ O	35.34	35.56
Total	100.11	100.00

(1) Suckow mine, Boron, California, USA. (2) NaCaB₅O₆(OH)₆•5H₂O.

Occurrence: Typically in playa and salt-marsh deposits in arid regions and bedded sedimentary deposits formed from these, the boron supplied from surrounding hot springs. Some occurrences contain upwards of one billion tons of ulexite.

Association: Colemanite, borax, meyerhofferite, hydroboracite, probertite, glauberite, trona, mirabilite, calcite, gypsum, halite.

Distribution: In Chile, from near Iquique, and in a large deposit at the Surire salt lake, southeast of Arica, Tarapacá; from the Salar de Ascotan, Antofagasta. At more than 60 deposits in Jujuy, Salta, and Catamarca Provinces, Argentina. From Laguna Salinas, 70 km east of Arequipa, Peru. In the USA, at Columbus Marsh, Rhodes Marsh, and Teels Marsh, Esmeralda Co., Nevada; in California, from Death Valley and Saline Valley, Inyo Co., in the Kramer borate deposit, Boron, Kern Co. In Canada, at Windsor, Nova Scotia; from Hillsborough, in the Potash Corporation of America mine, Penobsquis evaporite deposit, near Sussex, with other minor occurrences in New Brunswick. From Niederellenbach, Hesse, Germany. Found near Bela Stena, Jarandol Basin, Serbia, ??Yugoslavia. At the Inder boron deposit, Kazakhstan. From the Da-Chaidan and Zazangzaka salt lakes, Tibet, China. In Turkey, immense deposits in the Bigadiç borate district, Balıkesir Province; in the Kirka borate deposit, Eskişehir Province.

Name: Honors George Ludwig Ulex (1811–1883), German chemist who obtained the first reliable analysis of the mineral.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 345–348. (2) Clark, J.R. and C.L. Christ (1959) Studies of borate minerals (V): reinvestigation of the X-ray crystallography of ulexite and probertite. Amer. Mineral., 44, 712–719. (3) Ghose, S., C. Wan, and J.R. Clark (1978) Ulexite, NaCaB₅O₆(OH)₆•5H₂O: structure refinement, polyanion configuration, hydrogen bonding, and fiber optics. Amer. Mineral., 63, 160–171.

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