

Gaylussite

Na₂Ca(CO₃)₂•5H₂O

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Crystal Data: Monoclinic. *Point Group:* 2/*m*. As flattened wedge-shaped crystals with dominant {110}, {011}, {001}, smaller {010}, {100}, {101}, {112}; also as prismatic to dipyrarnidal crystals elongated along [100], to 6 cm.

Physical Properties: *Cleavage:* On {110}, perfect; on {001}, imperfect. *Fracture:* Conchoidal. *Tenacity:* Very brittle. *Hardness* = 2.5–3 *D*(meas.) = 1.991 *D*(calc.) = 1.991 Dehydrates with efflorescence in dry air; slowly decomposes in H₂O leaving CaCO₃ as calcite or aragonite.

Optical Properties: Transparent to translucent. *Color:* Colorless to pale yellow or pale gray, white; colorless in transmitted light. *Streak:* White to pale gray. *Luster:* Vitreous. *Optical Class:* Biaxial (–). *Orientation:* *X* = *b*; *Z* ∧ *c* = –15°. *Dispersion:* *r* < *v*, strong, crossed. *α* = 1.444 *β* = 1.516 *γ* = 1.523 *2V*(meas.) = 34°

Cell Data: *Space Group:* *C*2/*c*. *a* = 11.589 *b* = 7.780 *c* = 11.207 *β* = 102.5° *Z* = 4

X-ray Powder Pattern: John Hay, Jr. Well No. 1, Wyoming, USA.
6.403 (100), 3.18 (80), 2.70 (80), 2.61 (80), 1.91 (80), 2.49 (70), 1.98 (70)

Chemistry:

	(1)	(2)
CO ₂	30.02	29.72
SiO ₂	0.08	
Fe ₂ O ₃	0.03	
MnO	0.01	
MgO	0.01	
CaO	19.02	18.94
Na ₂ O	20.40	20.93
H ₂ O	30.47	30.41
insol.	0.16	
Total	100.20	100.00

(1) Taboos-nor salt lake, Mongolia. (2) Na₂Ca(CO₃)₂•5H₂O.

Occurrence: Typically in evaporites or shales from alkali lakes; rarely in veinlets cutting alkaline igneous rocks.

Association: Shortite, northupite, pirssonite, trona (Green River Formation, Wyoming, USA); thermonatrite, shortite, villiaumite, ferrian “biotite”, pectolite, potassian feldspar, aegirine (Khibiny massif, Russia).

Distribution: From Lagunillas, 80 km southeast of Mérida, Venezuela. In the USA, in California, at Mono Lake, Mono Co., Borax Lake, Lake Co., Deep Spring Lake, Inyo Co., China Lake, Kern Co., and Searles Lake, San Bernardino Co.; in the Green River Formation, Sweetwater Co., Wyoming; at several localities in the Carson Desert, near Ragtown, Nevada. Large crystals from Lake Amboseli, Kenya. At Lake Eyasi, Tanzania. On Zoutpan Farm, 40 km northwest of Pretoria, Transvaal, South Africa. At the Taboos-nor salt lake, eastern Gobi Desert, Mongolia. From the Olenii Rucheii area, Khibiny massif, Kola Peninsula, Russia. Around Mt. Erebus, Victoria Land, Antarctica.

Name: Honors Joseph Louis Gay-Lussac (1778–1850), noted French chemist and physicist.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana’s system of mineralogy, (7th edition), v. II, 234–235. (2) Fahey, J.J. (1962) Saline minerals of the Green River Formation. U.S. Geol. Surv. Prof. Paper 405, 24, 49. (3) Menchetti, S. (1968) The crystal structure of gaylussite. Atti Rend. Accad. Lincei, 44, 680–694.

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