

Tychite



Crystal Data: Cubic. *Point Group:* $2/m\bar{3}$. Crystals, to 8 mm, display {111}, perhaps modified by small {100}.

Physical Properties: *Fracture:* Conchoidal. *Tenacity:* Brittle. Hardness = 3.5-4
D(meas.) = 2.367-2.743 D(calc.) = 2.58

Optical Properties: Transparent to translucent. *Color:* White; colorless in transmitted light.
Luster: Vitreous.
Optical Class: Isotropic. $n = 1.508-1.510$

Cell Data: *Space Group:* $Fd\bar{3}$. $a = 13.9038(2)$ $Z = 8$

X-ray Powder Pattern: Searles Lake, California, USA.
2.674 (100), 4.18 (76), 2.459 (40), 3.190 (24), 1.605 (24), 2.006 (17), 1.736 (17)

Chemistry:	(1)	(2)
SO ₃	15.07	15.32
CO ₂	33.50	33.68
MgO	15.80	15.42
<u>Na₂O</u>	<u>35.57</u>	<u>35.58</u>
Total	99.94	100.00

(1) Searles Lake, California, USA; average of two analyses. (2) Na₆Mg₂(CO₃)₄(SO₄).

Polymorphism & Series: Forms series with ferrotychite and manganotychite.

Mineral Group: Northupite group.

Occurrence: Uncommon in lake-bed evaporite deposits.

Association: Northupite, gaylussite, thénardite, schairerite, pirssonite (Searles Lake, California, USA); northupite (Katwe Lake, Uganda).

Distribution: In the USA, from Searles Lake, San Bernardino Co., California; and in the Green River Formation, Northern Piceance Creek Basin, Colorado. At Lake Katwe, western Uganda.

Name: From the Greek for *good fortune*, as the first and one of the last ten crystals examined were of this species, from a lot of about 5000 examined.

Type Material: Yale University, New Haven, Connecticut, USA (3.1634).

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 294-295. (2) Mwanje, J. and Y. Kaahwa (1977) Observations on Uganda tychite. Mineral. Record, 8, 396. (3) Keester, K.L., G.J. Johnson, Jr., and V. Vand (1969) New data on tychite. Amer. Mineral., 54, 302-305. (4) Schmidt, G.R., J. Reynard, H. Yang, and R.T. Downs (2006) Tychite, Na₆Mg₂(SO₄)(CO₃)₄: structure analysis and Raman spectroscopic data. Acta Crystallogr., E62, i207-i209. (5) (2007) Amer. Mineral., 92(4), 707 (abs. ref. 4).