Teepleite $Na_2B(OH)_4Cl$

Crystal Data: Tetragonal. *Point Group:* $4/m\ 2/m\ 2/m$. Crystals are tabular on {001}, in rounded lenslike shapes composed of {001} and {101}, to 5 cm; commonly forms aggregates of rosettes.

Physical Properties: *Fracture:* Irregular to subconchoidal. *Tenacity:* Very brittle. Hardness = 3–3.5 D(meas.) = 2.076 D(calc.) = 2.070 (synthetic). Soluble in H_2O; alters to tincalconite on exposure.

Optical Properties: Transparent. *Color:* Colorless to white, pale buff due to organic inclusions; colorless in transmitted light. *Luster:* Vitreous to greasy, dulled on exposure to air. *Optical Class:* Uniaxial (–). $\omega = 1.519$ $\epsilon = 1.503$

Cell Data: *Space Group:* $P4/nmm$. $a = 7.260(2)$ $c = 4.847(2)$ $Z = 2$

X-ray Powder Pattern: Synthetic.
2.697 (10), 2.015 (9), 2.90 (8), 1.659 (8), 2.264 (7), 1.815 (7), 1.709 (7)

Chemistry:

	(1)	(2)
B_2O_4	22.05	26.71
CO_3	9.42	
Ca	0.08	
Na	28.93	28.69
Cl	18.72	22.12
H_2O	20.48	22.48
insol.	0.15	
Total	99.83	100.00

(1) Borax Lake, California, USA; after deduction of Ca as calcite and remaining CO_2 as trona, corresponds to $Na_{2.00}B_{1.00}(OH)_{3.69}Cl_{1.03}$. (2) $Na_2B(OH)_4Cl$.

Occurrence: Formed by reaction of boron-rich brines with halite in an extremely desiccated lake (Borax Lake, California, USA).

Association: Halite, trona, burkeite, hanksite.

Distribution: In the USA, in California, from Borax Lake, Lake Co., and in large crystals at Searles Lake, San Bernardino Co.

Name: Honors John Edgar Teeple (1874–1931), for his work on the chemistry of Searles Lake, California, USA.

Type Material: Harvard University, Cambridge, Massachusetts, 95832; National Museum of Natural History, Washington, D.C., USA, 97449.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 372–373. (2) Ross, V. and J.O. Edwards (1959) Tetrahedral boron in teepleite and bandylite. Amer. Mineral., 44, 875–877. (3) Effenberger, H. (1982) Verfeinerung der Kristallstruktur von synthetischem Teepleit. Acta Cryst., 38, 82–85 (in German).