Tincalconite $Na_2B_4O_5(OH)_4 \cdot 3H_2O$

Crystal Data: Hexagonal. *Point Group:* 32. Rare crystals are pseudo-octahedral, exhibiting $\{10\bar{1}1\}$, $\{01\bar{1}2\}$, and $\{0001\}$, to 1 cm; commonly as a powder.

Physical Properties: Hardness = n.d. D(meas.) = 1.880 D(calc.) = 1.894

Optical Properties: Transparent to translucent. *Color:* Colorless to white; colorless in transmitted light. *Luster:* Vitreous to dull.
Optical Class: Uniaxial (+). $\omega = 1.461$ $\epsilon = 1.474$

Cell Data: *Space Group:* $R32$. $a = 11.097(2)$ $c = 21.114(4)$ Z = 9

X-ray Powder Pattern: Synthetic. (ICDD 7-277).
2.92 (100), 4.38 (90), 8.75 (55), 3.44 (55), 2.187 (40), 4.71 (30), 3.00 (30)

Chemistry:

	(1)	(2)
B_2O_3	47.52	47.80
Na_2O	20.80	21.28
H_2O	30.59	30.92
insol.	0.48	
Total	99.39	100.00

(1) Kramer district, California, USA. (2) $Na_2B_4O_5(OH)_4 \cdot 3H_2O$.

Occurrence: Typically a dehydration product of other borates.

Association: Borax, kernite.

Distribution: Probably more widespread than the few recorded localities suggest. In the USA, from the Kramer borate deposit, Boron, Kern Co. and as crystals at Searles Lake, San Bernardino Co., California. From the Tincalayu borax deposit, Salar del Hombre Muerto, Salta Province, Argentina. In the Kirka borate deposit, Eskiçehir Province, Turkey. At Larderello, Val di Cecina, Tuscany, Italy. From mud volcanoes, Kerch Peninsula, Ukraine.

Name: From *tincal*, an Oriental name for *borax*, and the Greek for *powder*, in allusion to the typical powdery habit.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 337–339. (2) Powell, D.R., D.F. Gaines, P.J. Zerella, and R.A. Smith (1991) Refinement of the structure of tincalconite. Acta Cryst., C47, 2279–2282.