

Qilianshanite

$\text{H}_3\text{Na}(\text{HCO}_3)(\text{BO}_3) \cdot 2\text{H}_2\text{O}$

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Crystal Data: Monoclinic. *Point Group:* 2. Crystals are tabular to prismatic, to 2 mm, commonly in massive aggregates. *Twinning:* Polysynthetic.

Physical Properties: *Cleavage:* {100} and {010}, perfect. Hardness = ~ 2
D(meas.) = 1.706 D(calc.) = 1.639 Soluble in H_2O .

Optical Properties: Transparent. *Color:* Colorless. *Streak:* White. *Luster:* Vitreous.
Optical Class: Biaxial (-). *Orientation:* $X = b$; $Y \wedge a = 1^\circ$; $Z \wedge c = 9^\circ$. *Dispersion:* $r < v$, medium. $\alpha = [1.351]$ $\beta = 1.459(2)$ $\gamma = 1.486(2)$ $2V(\text{meas.}) = 50^\circ$

Cell Data: *Space Group:* C2. $a = 16.119(8)$ $b = 6.928(4)$ $c = 6.730(3)$ $\beta = 100.46(4)^\circ$
 $Z = 4$

X-ray Powder Pattern: Juhongtu deposit, China.
3.464 (100), 3.173 (59), 6.36 (25), 1.731 (19), 4.203 (6), 2.608 (5), 2.642 (3)

Chemistry:	(1)	(2)
CO_2	16.99	24.20
B_2O_3	20.02	19.14
MgO	0.05	
CaO	0.22	
Na_2O	17.92	17.04
H_2O	43.11	39.62
Total	98.31	100.00

- (1) Juhongtu deposit, China; corresponds to $\text{H}_{8.86}\text{Na}_{1.08}\text{Ca}_{0.01}\text{C}_{0.71}\text{B}_{1.06}\text{O}_{8.00}$.
(2) $\text{H}_3\text{Na}(\text{HCO}_3)(\text{BO}_3) \cdot 2\text{H}_2\text{O}$, confirmed by crystal-structure analysis.

Occurrence: Formed by reaction of borate-rich waters with earlier sodium carbonates in a borate deposit.

Association: Tinalconite, nahcolite, calcite, quartz.

Distribution: From the Juhongtu borate deposit, Qilian Mountains, Qinghai Province, China.

Name: For its occurrence in the Qilian Mountains, China.

Type Material: National Museum of Geology, Beijing, China.

References: (1) Luo Shiqing, Lu Jian'an, Wang Liben, and Zhu Jingqing (1993) Qilianshanite – a new boric carbonate mineral. *Acta Mineral. Sinica*, 13(2), 97–101 (in Chinese with English abs.). (2) (1994) *Amer. Mineral.*, 79, 765 (abs. ref. 1). (3) Wang Liben, Shi Jianqiu, and Zhou Kangling (1994) Crystal structure of qilianshanite. *Geol. Rev.*, 40(4), 347–353 (in Chinese with English abs.).