

Hydroastrophyllite



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Crystal Data: Triclinic. *Point Group:* n.d. In aggregates of blocky crystals.

Physical Properties: *Cleavage:* Two sets. *Hardness* = n.d. $D(\text{meas.}) = 3.151$
 $D(\text{calc.}) = [2.82]$

Optical Properties: Semitransparent. *Color:* Dark brown.

Optical Class: Biaxial (-). *Pleochroism:* X = bright yellow; Y = orange-yellow; Z = dull yellow.

Absorption: $Z > Y > X$. $\alpha = 1.660$ $\beta = 1.720$ $\gamma = 1.728$ $2V(\text{meas.}) = 40^\circ$

Cell Data: *Space Group:* n.d. $a = 11.86$ $b = 11.98$ $c = 5.42$ $\alpha = 103^\circ 25'$ $\beta = 95^\circ 9'$
 $\gamma = 112^\circ 12'$ $Z = [1]$

X-ray Powder Pattern: Sichuan Province, China.

3.51 (10), 10.55 (9), 2.643 (8), 2.118 (6), 1.768 (6), 2.584 (5)

Chemistry:

| | (1) | | (1) |
|--------------------------------|-------|-------------------------------|-------|
| SiO ₂ | 25.72 | MgO | 0.51 |
| TiO ₂ | 9.63 | CaO | 2.40 |
| MnO ₂ | 3.37 | BaO | 0.32 |
| Al ₂ O ₃ | 3.92 | Na ₂ O | 0.53 |
| Fe ₂ O ₃ | 24.24 | K ₂ O | 1.28 |
| Nb ₂ O ₅ | 5.01 | F | 1.83 |
| Ta ₂ O ₅ | 0.82 | H ₂ O ⁺ | 6.65 |
| FeO | 0.05 | H ₂ O ⁻ | 5.74 |
| MnO | 8.05 | -O = F ₂ | 0.77 |
| | | <hr/> | |
| | | Total | 99.30 |

(1) Sichuan Province, China; corresponds to $[(\text{H}_3\text{O})_{1.96}\text{Ca}_{0.51}\text{K}_{0.31}\text{Na}_{0.20}\text{Ba}_{0.02}]_{\Sigma=3.00}$
 $(\text{Fe}_{3.48}^{3+}\text{Mn}_{1.30}^{2+}\text{Mn}_{0.44}^{4+}\text{Mg}_{0.14})_{\Sigma=5.36}(\text{Ti}_{1.38}\text{Nb}_{0.43}\text{Ta}_{0.04})_{\Sigma=1.85}(\text{Si}_{4.92}\text{Al}_{0.88})_{\Sigma=5.80}$
 $[\text{O}_{20.01}(\text{OH})_{9.89}\text{F}_{1.10}]_{\Sigma=31.00}$.

Mineral Group: Astrophyllite group.

Occurrence: A product of weathering of an alkalic pegmatite.

Association: n.d.

Distribution: From an undefined locality in Sichuan Province, China.

Name: Presumably for the high water content, and its relation to *astrophyllite*.

Type Material: n.d.

References: (1) Hubei [Hupei] Geological College (1974) The crystal chemistry of astrophyllite group minerals. *Sci. Geol. Sin.*, 1, 18–33 (in Chinese). (2) (1975) *Amer. Mineral.*, 60, 736–737 (abs. ref. 1).