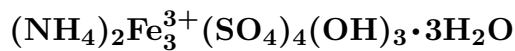


# Clairite



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**Crystal Data:** Triclinic. *Point Group:*  $\bar{1}$  or 1. As powdery aggregates of pseudo-hexagonal plates, to 50  $\mu\text{m}$ .

**Physical Properties:** *Cleavage:* Perfect on {001}. Hardness = n.d.  $D(\text{meas.}) = 2.31$   
 $D(\text{calc.}) = 2.32$  Slowly soluble in  $\text{H}_2\text{O}$ .

**Optical Properties:** Transparent to translucent. *Color:* Yellow.  
*Optical Class:* Biaxial. *Pleochroism:*  $X$  = pale yellow;  $Z'$  = dark yellow. *Orientation:*  $X = c$ .  
 $\alpha = 1.595$   $\beta = \text{n.d.}$   $\gamma = 1.607$   $2V(\text{meas.}) = \text{n.d.}$

**Cell Data:** *Space Group:* [ $P\bar{1}$  or  $P1$ ] (by analogy to metavoltine).  $a = 9.368$   $b = 9.150$   
 $c = 52.610$   $\alpha = 88.15^\circ$   $\beta = 90^\circ$   $\gamma = 118.36^\circ$   $Z = 8$

**X-ray Powder Pattern:** Lone Creek Fall Cave, South Africa.  
17.5 (100), 8.78 (100), 3.279 (25), 8.23 (20), 3.424 (20), 3.041 (20), 4.743 (15)

## Chemistry:

|                           | (1)   | (2)    |
|---------------------------|-------|--------|
| $\text{SO}_3$             | 43.86 | 46.21  |
| $\text{Al}_2\text{O}_3$   | 0.10  |        |
| $\text{Fe}_2\text{O}_3$   | 31.42 | 34.57  |
| $\text{Mn}_2\text{O}_3$   | 1.23  |        |
| $\text{Na}_2\text{O}$     | 0.35  |        |
| $\text{K}_2\text{O}$      | 0.03  |        |
| $(\text{NH}_4)_2\text{O}$ | 6.97  | 7.52   |
| $\text{H}_2\text{O}$      | 10.85 | 11.70  |
| insol.                    | 4.41  |        |
| Total                     | 99.22 | 100.00 |

(1) Lone Creek Fall Cave, South Africa; Na and K by flame photometry, insoluble is quartz; corresponding to  $[(\text{NH}_4)_{1.95}\text{Na}_{0.08}]_{\Sigma=2.03}(\text{Fe}_{2.87}\text{Mn}_{0.11}\text{Al}_{0.02})_{\Sigma=3.00}(\text{SO}_4)_4(\text{OH})_{3.03} \cdot 2.88\text{H}_2\text{O}$ .

(2)  $(\text{NH}_4)_2\text{Fe}_3(\text{SO}_4)_4(\text{OH})_3 \cdot 3\text{H}_2\text{O}$ .

**Occurrence:** A rare secondary mineral formed by alteration of pyrite to ferric sulfate, and reaction, at pH  $\sim 2$ , with ammonia produced as the result of decay of organic matter (*Hyrax* excreta).

**Association:** Loncreekite, sabieite, tschermigite.

**Distribution:** On the ceiling of Lone Creek Fall Cave, near Sabie, Eastern Transvaal, South Africa.

**Name:** Honors Claire Zingg Martini (1936–), wife of the author of the type description, who assisted her husband in cave exploration and mineral collecting.

**Type Material:** Museum of the Geological Survey, Pretoria, South Africa.

**References:** (1) Martini, J.E.J. (1983) Loncreekite, sabieite, and clairite, new secondary ammonium ferric-iron sulphates from Lone Creek Fall Cave, near Sabie, Eastern Transvaal. *Ann. Geol. Surv. S. Africa*, 17, 29–34. (2) (1986) *Amer. Mineral.*, 71, 229 (abs. ref. 1).