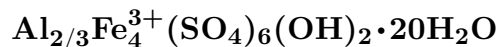


# Aluminocopiapite



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**Crystal Data:** Triclinic. *Point Group:*  $\bar{1}$ . As minute scales and efflorescences.

**Physical Properties:** *Tenacity:* “Fragile”. Hardness = [2–3] (by analogy to copiapite group members). D(meas.) = n.d. D(calc.) = 2.163 Somewhat soluble in H<sub>2</sub>O.

**Optical Properties:** Semitransparent. *Color:* Pale lemon-yellow to deep yellow.

*Optical Class:* Biaxial (+). *Pleochroism:* Y = colorless; Z = greenish yellow.  $\alpha = 1.525$   
 $\beta = 1.535$ – $1.540$   $\gamma = 1.585$ – $1.590$  2V(meas.) = Moderate.

**Cell Data:** *Space Group:*  $P\bar{1}$ .  $a = 7.30(1)$   $b = 18.80(2)$   $c = 7.31(1)$   $\alpha = 91.5(2)^\circ$   
 $\beta = 102.3(2)^\circ$   $\gamma = 98.7(1)^\circ$   $Z = 1$

**X-ray Powder Pattern:** Forty Mile River, Alaska, USA [magnesian aluminocopiapite].  
9.2 (10), 18.1 (8), 5.58 (8), 6.17 (7), 3.58 (5), 3.50 (5), 5.32 (3)

| <b>Chemistry:</b>              | (1)   | (2)   | (3)   |                   | (1)      | (2)     | (3)    |
|--------------------------------|-------|-------|-------|-------------------|----------|---------|--------|
| SO <sub>3</sub>                | 40.59 | 39.18 | 39.64 | MgO               | 0.28     | 1.94    |        |
| Al <sub>2</sub> O <sub>3</sub> | 3.08  | 3.12  | 2.80  | CaO               | 0.03     |         |        |
| Fe <sub>2</sub> O <sub>3</sub> | 25.62 | 23.16 | 26.35 | Na <sub>2</sub> O | 0.15     |         |        |
| FeO                            | 1.03  | 0.17  |       | K <sub>2</sub> O  | 0.01     |         |        |
| MnO                            | 0.08  |       |       | H <sub>2</sub> O  | [29.13]  | 30.40   | 31.21  |
| CoO                            |       | 0.16  |       | insol.            |          | 1.40    |        |
| CuO                            |       | 0.05  |       |                   |          |         |        |
|                                |       |       |       | Total             | [100.00] | [99.58] | 100.00 |

(1) 1-B mine, Canada; calculated from original elemental analysis, H<sub>2</sub>O by difference; corresponds to (Al<sub>0.70</sub>Fe<sub>0.18</sub><sup>2+</sup>Mg<sub>0.09</sub>Na<sub>0.06</sub>Mn<sub>0.01</sub>Ca<sub>0.01</sub>)<sub>Σ=1.05</sub>(Fe<sub>3.95</sub><sup>3+</sup>Al<sub>0.05</sub>)<sub>Σ=4.00</sub>(SO<sub>4</sub>)<sub>6.24</sub>(OH)<sub>2.26</sub>•18.79H<sub>2</sub>O.

(2) Forty Mile River, Alaska, USA; original total given as 99.69%, corresponds to (Mg<sub>0.59</sub>Al<sub>0.32</sub>Fe<sub>0.03</sub><sup>2+</sup>Co<sub>0.03</sub>Cu<sub>0.01</sub>)<sub>Σ=0.98</sub>(Fe<sub>3.57</sub><sup>3+</sup>Al<sub>0.43</sub>)<sub>Σ=4.00</sub>(SO<sub>4</sub>)<sub>6.02</sub>(OH)<sub>2.22</sub>•19.67H<sub>2</sub>O.

(3) Al<sub>2/3</sub>Fe<sub>4</sub><sup>3+</sup>(SO<sub>4</sub>)<sub>6</sub>(OH)<sub>2</sub>•20H<sub>2</sub>O.

**Mineral Group:** Copiapite group.

**Occurrence:** A secondary mineral typically formed by the oxidation of pyrite in shales and coal; may be a fumarolic reaction product.

**Association:** Pyrite.

**Distribution:** In the USA, from “Temple Rock”, [probably the Temple Mountain district, Emery Co.,] Utah; at Island Mountain, Trinity Co., and the Champion mine, White Mountains, Mono Co., California; in the Coeur d’Alene mine, Central City district, Gilpin Co., Colorado; from the Mosquito Fork of the Forty Mile River, Eagle A-3 quadrangle, Alaska. In the 1-B mine and the Emery seam at Glace Bay, Sydney Coalfield, Cape Breton, Nova Scotia, Canada. At Cerritos Bayos, southwest of Calama, Antofagasta, Chile. In Italy, from the Cetine mine, 20 km southwest of Siena, Tuscany, and at the Grotto de Faraglione, Port de Levante, Vulcano, Lipari Islands. In the Dolcoath mine, Camborne, Cornwall, England. From Morl, near Halle, Saxony-Anhalt, Germany.

**Name:** For its content of *aluminum* and relation to the *copiapite* group.

**Type Material:** National Museum of Natural History, Washington, D.C., USA, 93834, 103544.

**References:** (1) Berry, L.G. (1947) Composition and optics of copiapite. Univ. Toronto Studies, Geol. Ser., 51, 21–34 [aluminocopiapite]. (2) (1947) Amer. Mineral., 32, 483 (abs. ref. 1). (3) Zodrow, E.L. (1980) Hydrated sulfates from Sydney Coalfield, Cape Breton Island, Nova Scotia, Canada: the copiapite group. Amer. Mineral., 65, 961–967. (4) Bayliss, P. and A. Atencio (1985) X-ray powder diffraction data and cell parameters for copiapite-group minerals. Can. Mineral., 23, 53–56.

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