

# Apjohnite



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**Crystal Data:** Monoclinic. *Point Group:*  $2/m$ . As fibrous to acicular crystals, to 3 cm; asbestiform, in crusts, massive.

**Physical Properties:** Hardness = 1.5 D(meas.) = 1.78–1.81 D(calc.) = 1.836 Soluble in  $\text{H}_2\text{O}$ .

**Optical Properties:** Transparent to translucent. *Color:* Colorless to white, also tinted pale red, green, or yellow. *Luster:* Silky in aggregates.

*Optical Class:* Biaxial (–). *Orientation:*  $Y = b$ ;  $Z \wedge c \simeq 30^\circ$ .  $\alpha = 1.478$   $\beta = 1.482$   $\gamma = 1.482$   $2V(\text{meas.}) = \text{Small}$ .

**Cell Data:** *Space Group:*  $P2_1/c$ .  $a = 6.198(2)$   $b = 24.347(4)$   $c = 21.266(4)$   
 $\beta = 100.28(3)^\circ$   $Z = 4$

**X-ray Powder Pattern:** Terlano, Italy.

3.515 (100), 4.82 (90), 3.792 (33), 4.33 (27b), 3.967 (23), 4.13 (22), 6.07 (20)

## Chemistry:

|                         | (1)   | (3)    |
|-------------------------|-------|--------|
| $\text{SO}_3$           | 33.51 | 36.00  |
| $\text{Al}_2\text{O}_3$ | 10.65 | 11.46  |
| MnO                     | 6.60  | 7.98   |
| MgO                     | 0.36  |        |
| $\text{H}_2\text{O}$    | 48.15 | 44.56  |
| Total                   | 99.27 | 100.00 |

(1) Maputo Bay, Mozambique. (2) Terlano, Italy; AA partial analysis not given, corresponding to  $(\text{Mn}_{0.64}\text{Mg}_{0.28}\text{Zn}_{0.06}\text{Fe}_{0.02})_{\Sigma=1.00}\text{Al}_2(\text{SO}_4)_4 \cdot 22\text{H}_2\text{O}$ . (3)  $\text{MnAl}_2(\text{SO}_4)_4 \cdot 22\text{H}_2\text{O}$ .

**Mineral Group:** Halotrichite group.

**Occurrence:** As efflorescences.

**Association:** Halotrichite, pickeringite, gunningite, copiapite, epsomite.

**Distribution:** From Maputo (Delagoa) Bay, near Maputo (Lourenço Marques), Mozambique. At Terlano, Bolzano, Trentino-Alto Adige, Italy. From Smolník (Szomolnok), 16 km northeast of Rožňava, Slovakia. At Jáchymov (Joachimsthal), Czech Republic. In the USA, in Alum Cave, Sevier Co., Tennessee; at Alum Point, Salt Lake Co., Utah; from Creede, Mineral Co., Colorado; in Nevada, at the Twentieth Century mine, Nye Co., and long fibers at the Urania mine, Cactus Peak district; in the Dolores Tunnel mine, Old Placers district, Santa Fe Co., New Mexico.

**Name:** Honors Dr. James Apjohn (1796–1886), Professor of Chemistry and Mineralogy, Trinity College, Dublin, Ireland.

**References:** (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 527–528. (2) Menchetti, S. and C. Sabelli (1976) The halotrichite group: the crystal structure of apjohnite. Mineral. Mag., 40, 599–608.