Hohmannite \( \text{Fe}_2^3+\text{O(SO}_4\text{)}_2\cdot8\text{H}_2\text{O} \)

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Crystal Data: Triclinic. **Point Group:** \( \overline{1} \). Crystals are short prismatic along [001], to 1 mm, typically with dull or rounded and striated faces; as granular aggregates.

Physical Properties: **Cleavage:** \{010\}, perfect; \{110\} and \{1\overline{1}0\}, less perfect (referred to morphological axes; relation to X-ray axes uncertain). **Hardness** = 3 \( D(\text{meas.}) = 2.255 \) \( D(\text{calc.}) = 2.250 \) Decomposes in hot \( \text{H}_2\text{O} \); rapidly dehydrates to metahohmannite on exposure to air.

Optical Properties: Transparent to translucent. **Color:** Chestnut-brown to burnt orange, pale amaranth-red. **Streak:** Yellow-orange. **Luster:** Vitreous, brilliant. **Optical Class:** Biaxial (−). **Pleochroism:** \( X = \) pale yellow; \( Y = \) pale greenish yellow; \( Z = \) dark greenish yellow. **Orientation:** \( Y \wedge c = 23^\circ \). **Dispersion:** \( r > v \), extreme. \( \alpha = 1.553–1.559 \) \( \beta = 1.643 \) \( \gamma = 1.655–1.657 \) \( 2V(\text{meas.}) = 40^\circ \)

Cell Data: **Space Group:** \( \text{P}\overline{1} \). \( a = 9.148(1) \) \( b = 10.922(1) \) \( c = 7.183(3) \) \( \alpha = 90.29(6)^\circ \) \( \beta = 90.79(4)^\circ \) \( \gamma = 107.36(2)^\circ \) \( Z = 2 \)

X-ray Powder Pattern: Sierra Gorda district, Chile. 7.92 (FFF), 8.69 (FF), 10.36 (F), 3.46 (F), 5.31 (mF), 3.12 (mF), 3.95 (mf)

Chemistry: | (1) | (2) |
---|---|---|
\( \text{SO}_3 \) | 33.80 | 34.52 |
\( \text{Fe}_2\text{O}_3 \) | 33.92 | 34.42 |
\( \text{H}_2\text{O} \) | 30.76 | 31.06 |
insol. | 1.15 | |

Total 99.63 100.00

(1) Sierra Gorda district, Chile. (2) \( \text{Fe}_2\text{O(SO}_4\text{)}_2\cdot8\text{H}_2\text{O} \).

Occurrence: An uncommon low-temperature precipitate in oxidized iron sulfide deposits.

Association: Metahohmannite, copiapite, amaranthite, sideronatrite (Sierra Gorda district, Chile); chalcanthite, picromerite, amaranthite, fibroferrite, copiapite (Chuquicamata, Chile); metahohmannite, sulfur, cinnabar (Redington mine, California, USA).

Distribution: In Chile, in Antofagasta, from near Caracoles, Sierra Gorda district, and at Alcaparrosa, near Cerritos Bayos, both southwest of Calama; at Quetena, west of Calama; and from Chuquicamata. At the Redington mine, Knoxville, Napa Co., California, USA. From Saghand, Yazd, Iran. In the Plaka mine, near Laurium, Greece.

Name: Honors Thomas Hohmann (1843–1897), mining engineer of Valparaiso, Chile who discovered the first specimens.

Type Material: Mining Academy, Freiberg, Germany, 18623.