

Crystal Data: Orthorhombic (2*O* polytype) or monoclinic (2*M* polytype). *Point Group:* 2/*m* 2/*m* 2/*m* or 2/*m*. Rarely in good crystals, lathlike to acicular, to 3 cm; commonly fibrous, earthy, pulverulent, in efflorescences and crusts, nodular, massive.

Physical Properties: *Cleavage:* On {010}, perfect; on {100}, fair. *Tenacity:* Slightly flexible. Hardness = 1.5-2.5 *D*(meas.) = 2.22-2.35 *D*(calc.) = 2.276 Soluble in boiling H₂O, separating Fe₂O₃; reversibly dehydrates to metasideronatrite depending on relative humidity and sunlight.

Optical Properties: Semitransparent. *Color:* Lemon-yellow, straw-yellow, pale orange, yellow-brown; in transmitted light, nearly colorless to pale yellow. *Streak:* Pale yellow. *Luster:* Vitreous. *Optical Class:* Biaxial (+). *Pleochroism:* *X* = nearly colorless; *Y* = very pale amber-yellow; *Z* = pale amber-yellow. *Orientation:* *X* = *a*; *Y* = *b*; *Z* = *c*. *Dispersion:* *r* > *v*, strong. *α* = 1.508(3) *β* = 1.525(3) *γ* = 1.586(3) *2V*(meas.) = n.d. *2V*(calc.) = 58(5)°

Cell Data: *Space Group:* P2₁2₁2₁ *a* = 7.265(2) *b* = 20.522(6) *c* = 7.120(2) *Z* = 4 (2*O*)
P12₁/n1. *a* = 7.1559(14) *b* = 7.2845(15) *c* = 20.889(4) *β* = 99.37(3)° *Z* = 4 (2*M*)

X-ray Powder Pattern: Sierra Gorda [district], Chile.
10.15 (FFF), 3.01 (FF), 3.38 (F), 2.68 (F), 6.78 (mF), 3.58 (mF), 5.00 (f)

Chemistry:	(1)	(2)	(3)
SO ₃	42.98	43.87	43.49
Fe ₂ O ₃	22.40	21.88	20.95
Na ₂ O	17.00	16.98	15.43
H ₂ O	17.75	17.27	17.33
Total	100.13	100.00	99.31

(1) Sierra Gorda [district], Chile; corresponds to Na_{1.96}Fe_{1.00}(SO₄)_{1.92}(OH)_{1.12}·2.96H₂O.

(2) Na₂Fe(SO₄)₂(OH)·3H₂O. (3) Xitianshan lead-zinc deposit, Qinghai Province, China; total includes K₂O = 0.23, MgO = 0.1, Al₂O₃ = 0.42, FeO = 0.8, CaO = 0.56; corresponds to (Na_{1.83}Ca_{0.04}Fe_{0.04}K_{0.02}Mg_{0.01})_{Σ=1.94}(Fe³⁺_{0.97}Al_{0.03})_{Σ=1.00}(SO₄)₂(OH)(H₂O)₃ (2*M* polytype).

Polymorphism & Series: 2*O* and 2*M* polytypes.

Occurrence: An uncommon secondary mineral in the oxidized zone of iron-rich deposits in very arid climates, may be post-mine; also formed by alteration of pyrite by saline water in metallic veins, coal measures, and in sea-spray environments.

Association: Metasideronatrite, ferrinatrite, copiapite, voltaite, melanterite, halotrichite, uklonskovite, jurbanite, jarosite, pyrite, marcasite.

Distribution: In Chile, from the San Simon mine, Huantajaya, Tarapacá; in the Compania mine, Sierra Gorda district, southwest of Calama, and at Chuquicamata, Antofagasta. From Potosí, Bolivia. At the Santa Bárbara sulfur mine, El Palmar district, Jujuy Province, Argentina. On the Urus Plateau, Cheleken Peninsula, Caspian Sea, Turkmenistan. From north of Ballybunion, Co. Kerry, Ireland. At Barton-on-Sea, Hampshire, on Trerubies Cliff, near Delabole, Cornwall, and in the Rising Sun colliery, Backworth, Northumberland, England. From Winterslag and Eisden, Belgium. In the Polish Turossow brown coal mine, Turossow, Poland. From the Cetine mine, 20 km southwest of Siena, Tuscany, Italy. At the New Milo mine, Wadnaminga, South Australia. Large crystals in the Hot Springs Point sulfur mine, Crescent Valley, Eureka Co., Nevada, USA. From the Xitianshan lead-zinc deposit, Qinghai Province, China (2*M* polytype).

Name: From the Greek for iron, *sideros*, and sodium, *natrium*, in its chemical composition.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 604-605. (2) Cesbron, F. (1964) Contribution à la minéralogie des sulfates de fer hydratés. Bull. Soc. fr. Minéral., 87, 125-143 (in French). (3) Scordari, F. and G. Ventruti (2009) Sideronatrite, Na₂Fe(SO₄)₂(OH)·3H₂O: Crystal structure of the orthorhombic polytype and OD character analysis. Amer. Mineral., 94, 1679-1686. (4) Yang, Z., G. Giester, K. Ding, and H. Li (2015) Crystal structure of sideronatrite-2*M*, Na₂Fe(SO₄)₂(OH)(H₂O)₃, a new polytype from Xitianshan lead-zinc deposit, Qinghai Province, China Eur. J. Mineral., 27, 427-432.