

Ferrinatririte

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Crystal Data: Hexagonal. *Point Group:* $\bar{3}$. Crystals with hexagonal outline, short prismatic along [0001] to fibrous, $\{10\bar{1}0\}$, $\{11\bar{2}0\}$, with several terminating forms, to several mm; in stellate aggregates; cryptocrystalline to cleavable massive.

Physical Properties: *Cleavage:* On $\{10\bar{1}0\}$, perfect; on $\{11\bar{2}0\}$, less perfect. *Fracture:* Splintery. *Tenacity:* Brittle. Hardness = 2.5 D(meas.) = 2.55–2.61 D(calc.) = 2.55 Alters to sideronatririte in moist air.

Optical Properties: Transparent. *Color:* Colorless, grayish white, pale green, bluish green; colorless in transmitted light. *Luster:* Vitreous. *Optical Class:* Uniaxial (+). $\omega = 1.556\text{--}1.558$ $\epsilon = 1.610\text{--}1.613$

Cell Data: *Space Group:* $P\bar{3}$. $a = 15.566(5)$ $c = 8.69(1)$ $Z = 6$

X-ray Powder Pattern: Cetine mine, Italy. 7.78 (100), 2.909 (87), 3.430 (66), 2.938 (57), 2.827 (57), 3.297 (53), 4.39 (51)

| Chemistry: | (1) | (2) |
|--------------------------------|--------|--------|
| SO ₃ | 50.50 | 51.42 |
| Fe ₂ O ₃ | 18.02 | 17.10 |
| Na ₂ O | 19.10 | 19.91 |
| H ₂ O | 12.45 | 11.57 |
| Total | 100.07 | 100.00 |

(1) Sierra Gorda, Chile; total originally given as 100.11%. (2) Na₃Fe(SO₄)₃ · 3H₂O.

Occurrence: An oxidation product of iron sulfides, typically in arid regions; rarely fumarolic.

Association: Metavoltine, copiapite, coquimbite, sideronatririte, tamarugite, quenstedtite, römerite (Chile); gypsum, sideronatririte, metavoltine, tamarugite, uklonskovite, jurbanite, rostitite (Cetine mine, Italy).

Distribution: From various localities in the Atacama Desert, Chile, as at Mina la Compania, near Sierra Gorda, Atacama; at Alcaparrosa, near Cerritos Bayos, southwest of Calama, from Quetena, west of Calama, and at Chuquicamata, Antofagasta. From Vesuvius, Campania, and at the Cetine mine, near Rosia, Tuscany, Italy. In the Escuhu Formation, Teruel Province, and at the Lanjarón mineral springs, Granada Province, Spain.

Name: For the essential chemical components, FERRIc iron and sodium, NATRIum.

Type Material: n.d.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 456–458. (2) Sabelli, C. and A. Santucci (1987) Rare sulfate minerals from the Cetine mine, Tuscany, Italy. Neues Jahrb. Mineral., Monatsh., 171–182. (3) Scordari, F. (1977) The crystal structure of ferrinatririte, Na₃(H₂O)₃[Fe(SO₄)₃] and its relationship to Maus's salt, (H₃O)₂K₂K_{0.5}(H₂O)_{0.56}[Fe₃O(H₂O)₃(SO₄)₆](OH)₂. Mineral. Mag., 41, 375–383. (4) Cesbron, F. (1964) Contribution à la minéralogie des sulfates de fer hydratés. Bull. Soc. fr. Minéral., 87, 125–143 (in French).