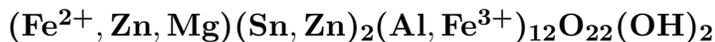


Nigerite-6H

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Crystal Data: Hexagonal. *Point Group:* $\bar{3}2/m$. Hexagonal crystals, to 1 cm, platy on {0001}, with poorly developed {10 $\bar{1}$ 1} and other trigonal faces; may form oriented overgrowths on gahnite.

Physical Properties: *Cleavage:* Distinct to perfect on {0001}. *Tenacity:* Brittle. Hardness = 8–9 D(meas.) = 4.25–4.51 D(calc.) = [4.44–4.55] Weakly magnetic.

Optical Properties: Transparent to translucent. *Color:* Dark brown, red-brown, red; brownish yellow, brown, or yellow in transmitted light. *Streak:* Yellow-brown. *Luster:* Vitreous. *Optical Class:* Uniaxial (+) or (-); birefringence 0.003–0.005. *Pleochroism:* Faint, patchy; *O* = brownish yellow, yellow-brown; *E* = pale brownish yellow, yellow. $\omega = 1.79$ – 1.80 $\epsilon = 1.80$ – 1.81

Cell Data: *Space Group:* $P\bar{3}m1$ or $P\bar{3}1m$. $a = 5.67$ – 5.72 $c = 13.79$ – 13.88 $Z = 1$

X-ray Powder Pattern: Egbe district, Nigeria.

2.83 (vs), 2.42 (vs), 1.644 (s), 1.541 (s), 4.64 (ms), 1.430 (ms), 1.413 (ms)

Chemistry:	(1)	(2)	(1)	(2)
SiO ₂	0.48	0.9	FeO	2.65
TiO ₂	0.17	3.3	MnO	0.09
SnO ₂	25.33	23.2	ZnO	4.51
Al ₂ O ₃	50.91	55.0	PbO	0.94
Ga ₂ O ₃		0.3	MgO	1.28
Fe ₂ O ₃	11.90		H ₂ O	1.57
			Total	99.83
				100.3

(1) Egbe district, Nigeria; corresponds to $(\text{Fe}_{0.39}^{2+}\text{Zn}_{0.38}\text{Mg}_{0.33}\text{Fe}_{0.09}^{3+}\text{Pb}_{0.04}\text{Mn}_{0.01})_{\Sigma=1.24}(\text{Sn}_{1.77}\text{Zn}_{0.21}\text{Ti}_{0.02})_{\Sigma=2.00}(\text{Al}_{10.52}\text{Fe}_{1.48}^{3+})_{\Sigma=12.00}[\text{O}_{22.16}(\text{OH})_{1.84}]_{\Sigma=24.00}$. (2) Caramos mine, Portugal; by wet chemical, X-ray fluorescence, colorimetric, and spectrographic methods, total Fe as FeO, H₂O by LOI at 1000 °C.

Polymorphism & Series: 6H and 24R polytypes are known.

Occurrence: In quartz-sillimanite rocks closely associated with tin-bearing granite pegmatites (Egbe district, Nigeria); in riebeckite gneiss (La Guia, Spain).

Association: Quartz, sillimanite, andalusite, muscovite, garnet, cassiterite, gahnite, chrysoberyl, columbite, apatite (Egbe district, Nigeria); quartz, albite, microcline, riebeckite, ferrian biotite, aegirine, zircon, fluorite (La Guia, Spain).

Distribution: From several occurrences in the Egbe district, Kabba Province, Nigeria. At the Caramos mine, Lixa, and other places between Felgueiras and Amarante, Portugal. From La Guia, Vigo, Pontevedra Province, Spain. In Sweden, at Falun. In the Rosendal pegmatite, Kemiö (Kimito) Island, Finland. From an undefined locality in Siberia, Russia. At Shizhuyuan, Guangxi Province, China. From the upper Candeias area, Rondônia, and elsewhere in the Araguaí-Amapará region, Amapá Territory, Brazil. In the Omaruru River tin deposits, Namibia.

Name: For Nigeria, the country where it was first found.

Type Material: n.d.

References: (1) Jacobson, R. and J.S. Webb (1947) The occurrence of nigerite, a new tin mineral in quartz-sillimanite-rocks from Nigeria. *Mineral. Mag.*, 28, 118–128. (2) Bannister, F.A., M.H. Hey, and H.P. Stadler (1947) Nigerite, a new tin mineral. *Mineral. Mag.*, 28, 129–136. (3) (1948) *Amer. Mineral.*, 33, 98 (abs. refs. 1 and 2). (4) Van Tassel, R. (1965) Nigerite from Lixa, near Felgueiras, Douro Litoral province, Portugal. *Mineral. Mag.*, 34, 482–486. (5) Grey, I.E. and B.M. Gatehouse (1979) The crystal structure of nigerite-24R. *Amer. Mineral.*, 64, 1255–1264. (6) Arakcheeva, A.V., D.Y. Pushcharovskii, R.K. Rastsvetaeva, A.A. Kashaev, and T.N. Nadezhina (1995) Crystal structure of nigerite-6H. *Kristallografiya (Sov. Phys. Crystal.)*, 40, 639–644.

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