

**Nigerite-24R**

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**Crystal Data:** Hexagonal. *Point Group:*  $\bar{3} 2/m$ . As hexagonal platelets, to 2 mm, and as oriented overgrowths on gahnite. *Twinning:* By two-fold rotation about [0001], observed as striations on {0001} and repeated intergrowths at 120°, also by X-ray diffraction effects.

**Physical Properties:** *Tenacity:* Brittle. Hardness = n.d. D(meas.) = n.d. D(calc.) = 4.42

**Optical Properties:** Transparent to translucent. *Color:* Colorless; very pale green in transmitted light.

*Optical Class:* Uniaxial.  $\omega$  = n.d.  $\epsilon$  = n.d.

**Cell Data:** *Space Group:*  $P\bar{3}m1$ .  $a = 5.730(3)$   $c = 55.60(3)$   $Z = 3$

**X-ray Powder Pattern:** n.d.

**Chemistry:**

	(1)
SiO <sub>2</sub>	0.89
SnO <sub>2</sub>	21.27
Al <sub>2</sub> O <sub>3</sub>	52.63
FeO	13.91
MnO	0.33
ZnO	8.12
CaO	1.06
H <sub>2</sub> O	[1.79]
Total	[100.00]

(1) Mt. Garnet, Australia; by electron microprobe, here computed from average of two elemental analyses, total Fe as FeO, H<sub>2</sub>O by difference; corresponds to  $(\text{Fe}_{2.66}\text{Zn}_{1.42}\text{Mn}_{0.06})_{\Sigma=4.14}\text{Sn}_{2.01}\text{Ca}_{0.28}(\text{Al}_{14.69}\text{Si}_{0.21}\text{Fe}_{0.10})_{\Sigma=15.00}\text{O}_{30}(\text{OH})_2$ .

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

**Occurrence:** In quartz-sillimanite rocks closely associated with tin-bearing granite pegmatites (Egbe district, Nigeria); in tin-bearing skarns (Mt. Garnet, Australia).

**Association:** Gahnite (Egbe district, Nigeria); magnetite, fluorite, biotite, gahnite, corundum, cassiterite (Mt. Garnet, Australia).

**Distribution:** Distinction of the 24R from the 6H polytype requires that the unit cell be determined, which has been accomplished for the following localities: from the Egbe district, Kabba Province, Nigeria. At the Mt. Garnet tin deposits, Queensland, Australia. In the Geco Cu–Zn deposit, Manitouwadge district, 80 km north-northeast of Lake Superior, Ontario, Canada.

**Name:** As the 24R polytype of *nigerite*-6H.

**Type Material:** Royal Ontario Museum, Toronto, Canada, M24546; National Museum of Natural History, Washington, D.C., USA, 146963.

; *nigerite*-6T = *ferronigerite*-2N1S; *nigerite*-24R = *ferronigerite*-6N6S; [full list given under *högböhmite*];