Nigerite-24R \( (\text{Fe}^{2+},\text{Zn})_4\text{Sn}_2(\text{Al},\text{Si},\text{Fe})_{15}\text{O}_{30}(\text{OH})_2 \)

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

\textit{Physical Properties:} \ Tenacity: Brittle. Hardness = n.d. \( D(\text{meas.}) = \text{n.d.} \) \( D(\text{calc.}) = 4.42 \)

\textit{Optical Properties:} Transparent to translucent. \textit{Color:} Colorless; very pale green in transmitted light.

\textit{Optical Class:} Uniaxial. \( \omega = \text{n.d.} \) \( \epsilon = \text{n.d.} \)

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

\textit{X-ray Powder Pattern:} n.d.

\textit{Chemistry:}

\begin{align*}
\text{SiO}_2 & \quad 0.89 \\
\text{SnO}_2 & \quad 21.27 \\
\text{Al}_2\text{O}_3 & \quad 52.63 \\
\text{FeO} & \quad 13.91 \\
\text{MnO} & \quad 0.33 \\
\text{ZnO} & \quad 8.12 \\
\text{CaO} & \quad 1.06 \\
\text{H}_2\text{O} & \quad [1.79] \\
\text{Total} & \quad [100.00]
\end{align*}

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

\textit{Polymorphism & Series:} 6H and 24R polytypes are known.

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

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

\textit{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.

\textit{Name:} As the 24R polytype of \textit{nigerite}-6H.


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