Ferrovalleriite 2(Fe,Cu)S·1.5Fe(OH)$_2$

Crystal Data: Hexagonal.  Point Group: $\overline{3} m$, $3 m$, or $32$.  As hexagonal or rounded plates to 5 mm, in rose-like aggregates of thin, distorted or curved flakes or as crusts to 2 cm.


Cell Data: Space Group: $R\overline{3} m$, $R3m$, or $R32$. \( a = 3.792(2) \) \( c = 34.06(3) \) Z = 3

X-ray Powder Pattern: Oktyabr’skiy mine, Norilsk district, Krasnoyarskiy Kray, Russia. 5.69 (100), 3.268 (58), 1.871 (45), 3.163 (36), 1.894 (34), 2.143 (19), 11.42 (18), 3.784 (17)

Chemistry:

\[
\begin{array}{c|c}
\text{Element} & \text{Formula} \\
\hline
\text{Al} & 0.10 \\
\text{Mn} & 0.03 \\
\text{Fe} & 45.31 \\
\text{Ni} & 0.07 \\
\text{Cu} & 18.29 \\
\text{S} & 20.37 \\
\text{O} & 15.62 \\
\text{H} & [0.98] \\
\hline
\text{Total} & 100.77 \\
\end{array}
\]

(1) Oktyabr’skiy mine, Norilsk district, Krasnoyarskiy Kray, Russia; average of 6 electron microprobe analyses, $\text{Fe}^{2+}/\text{Fe}^{3+}$ calculated for charge balance, H calculated as if present only as OH, presence of OH and absence of H$_2$O confirmed by IR spectroscopy; corresponding to $(\text{Fe}_{1.09}\text{Cu}_{0.91})_{2-2.00}\text{S}_2(\text{Fe}^{2+0.13}\text{Fe}^{3+0.12}\text{Al}_{0.01})_{2-1.47}(\text{OH})_{3.07}$.

Mineral Group: Valleriite group.

Occurrence: Of low-temperature hydrothermal origin coating cavities in pentlandite-mooihoekite-cubanite ore with minor magnetite and chalcopyrite.

Association: Ferrotolithinite, magnetite, an Fe-rich chlorite-type phyllosilicate, hibbingite, rhodochrosite.

Distribution: From several Cu-Ni-PGM deposits of the Norilsk region, including at the Oktyabr’skiy mine, Talnakh, Krasnoyarskiy Kray, Siberia, Russia.

Name: As the structural analogue (based on chemical, X-ray, and IR data similarities) of valleriite with essential ferrous iron.

Type Material: A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia.