Ferrocolumbite \((\text{Fe}^{2+}, \text{Mn}^{2+})(\text{Nb}, \text{Ta})_2\text{O}_6\)

Crystal Data: Orthorhombic. Point Group: \(2\overline{m} 2/m 2\overline{m} 2/m\). Crystals short prismatic or equant, also flat tabular, to 0.75 m. In groups of parallel or subparallel crystals, to 18 t; massive. Twinning: Common as heart-shaped contact and penetration twins, on \(\{021\}\) and \(\{023\}\), may produce pseudohexagonal trillings. More rarely on \(\{051\}\) and \(\{15\bullet 1\bullet 0\}\).


Optical Properties: Opaque, translucent through thin edges. Color: Black to brownish black; reddish brown in transmitted light; in reflected light, grayish white with a brownish tint and reddish internal reflections. Streak: Black to dark brown. Luster: Submetallic to vitreous, commonly tarnished iridescent. Optical Class: Biaxial (−). Orientation: \(X = b; Y = a; Z = c\). Dispersion: \(r < v\). Absorption: Strong; \(Z > X\). \(\alpha = \text{n.d.}\) \(\beta = 2.29–2.40\) \(\gamma = \text{n.d.}\) \(2V(\text{meas.}) = \text{n.d.}\)


Cell Data: Space Group: \(Pbcn\) (synthetic). \(a = 14.266(1)\) \(b = 5.7321(4)\) \(c = 5.0503(4)\) \(Z = 4\)

X-ray Powder Pattern: Tinton (?), South Dakota, USA; similar to wodginite or ixiolite. 2.96 (100), 3.66 (48), 1.721 (22), 1.772 (14), 1.465 (14), 7.13 (12), 2.49 (12)

Chemistry: \(\begin{array}{ccc}
\text{Nb}_2\text{O}_5 & 72.37 & 51.72 & 78.72 \\
\text{Ta}_2\text{O}_5 & 5.26 & 28.68 & \\
\text{WO}_3 & 0.28 & \\
\text{TiO}_2 & 1.30 & \\
\text{SnO}_2 & 0.67 & 0.46 \\
\text{FeO} & 15.04 & 13.03 & 21.28 \\
\text{MnO} & 5.97 & 5.34 \\
\text{CaO} & 0.58 & 0.01 \\
\hline
\text{Total} & 99.89 & 100.82 & 100.00
\end{array}\)

(1) Ånneröd, Norway. (2) Kings Mountain, North Carolina, USA; by electron microprobe, corresponds to \((\text{Fe}_{0.68}\text{Mn}_{0.28}\text{Sn}_{0.06}\text{W}_{0.01})\Sigma=1.04(\text{Nb}_{1.50}\text{Ta}_{0.50})\Sigma=2.00\text{O}_6\). (3) Fe Nb_2 O_6.

Polymorphism & Series: Forms two series, with ferrotantalite and with manganocolumbite.

Occurrence: An accessory constituent of granite pegmatites; rarely in carbonatites; a detrital mineral in placer deposits.

Association: Albite, microcline, beryl, lepidolite, muscovite, tourmaline, spodumene, lithiophilite, triphylite, amblygonite, triplite, apatite, samarskite, microlite, cassiterite.


Name: For iron (FERum), and COLUMBia, for America, source of the first specimens.

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**References:**

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