Niobocarbide  \((\text{Nb, Ta})\text{C}\)

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Crystal Data: Hexagonal. Point Group: \(6\text{mm}\). As euhedral hexagonal plates, to 1 mm, exhibiting \{0001\}, \{10\overline{1}0\}, and \{10\overline{1}1\}; as exsolution lamellae in vanadian magnetite; commonly aggregated into crusts and massive vein fillings.

Physical Properties: Hardness = \(\sim 5\)  VHN = 710–760, 734 average (20 g load). D(meas.) = 4.65  D(calc.) = 4.60


Cell Data: Space Group: \(P6_3\text{mc}\). \(a = 5.846–5.897\ c = 9.254–9.295\ Z = 1\)

X-ray Powder Pattern: Saskatchewan, Canada. 3.44 (100), 2.66 (90), 2.49 (90), 1.945 (60), 4.66 (55), 2.23 (50), 2.46 (40)

Chemistry:

\[
\begin{array}{ccc}
\text{Ti} & 3.7 & 6.7 \\
\text{V} & 45.0 & 33.5 \\
\text{Al} & 0.9 & 0.8 \\
\text{Fe} & 15.9 & 24.0 \\
\text{Mn} & < 0.1 & 0.1 \\
\text{Mg} & < 0.1 & 0.1 \\
\text{Na} & 0.1 & 0.2 \\
\end{array}
\]

Total

(1–2) Kalgoorlie, Western Australia; by electron microprobe; V and Fe valences and \((\text{OH})^{1−}\) from crystal-structure analysis, corresponding respectively to \((\text{V}^{3+} \text{Fe}^{3+} \text{Fe}^{2+} \text{Ti}^{3+} \text{Al}^{3+})_{10} \text{O}_{14} (\text{OH})_2\) and \((\text{V}^{3+} \text{Fe}^{3+} \text{Fe}^{2+} \text{Ti}^{3+} \text{Al}^{3+})_{10} \text{O}_{14} (\text{OH})_2\).

Occurrence: In hydrothermal uranium deposits (Saskatchewan, Canada); in gold deposits in metamorphosed greenstones (Kalgoorlie, Western Australia).

Association: Dolomite, calcite, quartz, uraninite, pyrite, chalcopryite, galena, ilmenite, hematite, carnitite (Saskatchewan, Canada); gold, gold tellurides, vanadian muscovite, tourmaline, tivanite, vanadium hematite, vanadian magnetite (Kalgoorlie, Western Australia).

Distribution: From Fish-Hook Bay, Lake Athabaska, and at the Ace mine, the Consolidated Nicholson Mine No. 2, and the Pitche claims, Beaverlodge Lake, Saskatchewan, Canada. From Wild Steer Canyon, Paradox Valley, Montrose Co., Colorado, and in the Campbell mine, Bisbee, Cochise Co., Arizona, USA. In several mines at Kalgoorlie, Western Australia. From the Mounana uranium mine, Franceville, Gabon.

Name: To honor Dr. Thomas Brennan Nolan (1901–1992), formerly Director of the U.S. Geological Survey, Washington, D.C., USA.


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