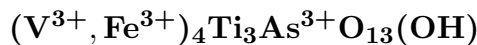


Tomichite

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Crystal Data: Monoclinic. *Point Group:* $2/m$. In euhedral tabular crystals, to 3 mm.**Physical Properties:** *Fracture:* Conchoidal. Hardness = 6 VHN = 800(136) (50 g load). D(meas.) = 4.16 D(calc.) = 4.42**Optical Properties:** Opaque. *Color:* Black; gray in reflected light. *Streak:* Black.*Optical Class:* Biaxial. *Anisotropism:* Moderate; yellowish gray to dark gray. R_1 – R_2 : (400) 17.9–18.3, (420) 17.5–17.9, (440) 17.2–17.6, (460) 17.0–17.5, (480) 17.0–17.5, (500) 16.9–17.5, (520) 17.0–17.6, (540) 17.0–17.7, (560) 17.1–17.8, (580) 17.1–17.9, (600) 17.2–17.9, (620) 17.2–18.0, (640) 17.2–18.0, (660) 17.2–18.0, (680) 17.3–18.0, (700) 17.3–18.0**Cell Data:** *Space Group:* $P2_1/m$, with $a = 7.119(3)$ $b = 14.176(5)$ $c = 4.992(2)$ $\beta = 105.05(1)^\circ$ $Z = 2$, or *Space Group:* $A2/m$ (barian), with $a = 7.105(4)$ $b = 14.217(4)$ $c = 5.043(2)$ $\beta = 104.97(7)^\circ$ $Z = 2$ **X-ray Powder Pattern:** Kalgoorlie, Western Australia.

2.663 (10), 2.836 (9), 1.572 (5), 3.092 (4), 2.023 (3), 1.712 (3), 4.994 (2)

Chemistry:

| | (1) | (2) |
|--------------------------------|---------|-------|
| SiO ₂ | 0.21 | |
| TiO ₂ | 37.42 | 27.23 |
| Al ₂ O ₃ | | 0.98 |
| Fe ₂ O ₃ | 11.39 | 13.14 |
| V ₂ O ₃ | 34.92 | 34.78 |
| As ₂ O ₃ | 11.31 | 13.27 |
| Sb ₂ O ₃ | 1.22 | 0.81 |
| BaO | | 7.58 |
| H ₂ O | [1.36] | |
| Total | [97.83] | 97.79 |

(1) Kalgoorlie, Western Australia; by electron microprobe, average of four analyses, total Fe as Fe₂O₃, total V as V₂O₃, total As as As₂O₃, total Sb as Sb₂O₃, H₂O calculated from stoichiometry; corresponding to $(\text{V}_{3.08}^{3+}\text{Fe}_{0.94}^{3+})_{\Sigma=4.02}\text{Ti}_{3.10}(\text{As}_{0.76}^{3+}\text{Sb}_{0.06}^{3+}\text{Si}_{0.02})_{\Sigma=0.84}\text{O}_{13}(\text{OH})$.(2) Hemlo deposit, Canada; by electron microprobe, average of several analyses Fe²⁺:Fe³⁺ calculated from charge balance; corresponding to $(\text{V}_{3.29}^{3+}\text{Fe}_{1.09}^{3+}\text{Al}_{0.13}\text{Fe}_{0.08}^{2+})_{\Sigma=4.59}\text{Ti}_{2.41}(\text{As}_{0.95}^{3+}\text{Ba}_{0.35}\text{Sb}_{0.04}^{3+})_{\Sigma=1.34}\text{O}_{13}(\text{OH})$.**Occurrence:** In a specimen from a hydrothermal gold deposit (Kalgoorlie, Western Australia); in a gold deposit at the contact of felsic metavolcanic and metasedimentary rocks (Hemlo deposit, Canada).**Association:** Vanadian muscovite, rutile, pyrite, calaverite, calcite, quartz (Kalgoorlie, Western Australia); quartz, microcline, barite, pyrite, molybdenite, stibnite, arsenic, sphalerite, zinkenite, aktashite, tetrahedrite, vanadian muscovite (Hemlo mine, Canada).**Distribution:** In Western Australia, from Kalgoorlie, probably from the Perseverance mine. In the Hemlo gold deposit, Thunder Bay district, Ontario, Canada.**Name:** To honor Stephan A. Tomich (1914–), consulting geologist, Perth, Western Australia, who presented the first specimen for examination.**Type Material:** Western Australian Museum, Perth, Australia, M.67.1991, MDC6417; The Natural History Museum, London, England, 1979,532; National Museum of Natural History, Washington, D.C., USA, 146187.**References:** (1) Nickel, E.H. and I.E. Grey (1979) Tomichite, a new oxide mineral from Western Australia. *Mineral. Mag.*, 43, 469–471. (2) (1980) *Amer. Mineral.*, 65, 811 (abs. ref. 1). (3) Grey, I.E., I.C. Madsen, and D.C. Harris (1987) Barian tomichite, Ba_{0.5}(As₂)_{0.5}Ti₂(V, Fe)₅O₁₃(OH), its crystal structure and relationship to derbylite and tomichite. *Amer. Mineral.*, 72, 201–208.

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