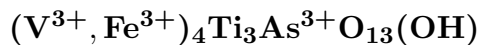


# Tomichite



©2001-2005 Mineral Data Publishing, version 1

**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 <sub>2</sub>	0.21	
TiO <sub>2</sub>	37.42	27.23
Al <sub>2</sub> O <sub>3</sub>		0.98
Fe <sub>2</sub> O <sub>3</sub>	11.39	13.14
V <sub>2</sub> O <sub>3</sub>	34.92	34.78
As <sub>2</sub> O <sub>3</sub>	11.31	13.27
Sb <sub>2</sub> O <sub>3</sub>	1.22	0.81
BaO		7.58
H <sub>2</sub> O	[1.36]	
Total	[97.83]	97.79

(1) Kalgoorlie, Western Australia; by electron microprobe, average of four analyses, total Fe as Fe<sub>2</sub>O<sub>3</sub>, total V as V<sub>2</sub>O<sub>3</sub>, total As as As<sub>2</sub>O<sub>3</sub>, total Sb as Sb<sub>2</sub>O<sub>3</sub>, H<sub>2</sub>O 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 Fe<sup>2+</sup>:Fe<sup>3+</sup> 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<sub>0.5</sub>(As<sub>2</sub>)<sub>0.5</sub>Ti<sub>2</sub>(V, Fe)<sub>5</sub>O<sub>13</sub>(OH), its crystal structure and relationship to derbylite and tomichite. *Amer. Mineral.*, 72, 201–208.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise without the prior written permission of Mineral Data Publishing.