

Crystal Data: Monoclinic, pseudotetragonal. *Point Group:* $2/m$, m , or 2 .

Twinning: Common, according to some simple law. As lathlike or anhedral grains, to 70 μm ; may rim or intergrow with aurostibite, gold, and antimony.

Physical Properties: Hardness = 3–3.5 VHN = 94–129 (25 g load). $D(\text{meas.}) = 6.86(7)$ (synthetic). $D(\text{calc.}) = 6.57$

Optical Properties: Opaque. *Color:* Gray-blue in reflected light. *Streak:* Black.

Luster: Metallic. *Pleochroism:* Weak, from gray-blue to slightly greenish gray-blue.

Anisotropism: Distinct to moderate, from buff to slate gray.

R_1 – R_2 : (400) 40.6–41.8, (420) 40.1–41.0, (440) 39.4–40.1, (460) 38.6–39.4, (480) 38.1–39.2, (500) 37.6–39.1, (520) 37.3–38.9, (540) 36.7–38.4, (560) 36.1–38.0, (580) 35.6–37.6, (600) 35.0–37.2, (620) 34.4–36.6, (640) 33.7–36.0, (660) 33.1–35.3, (680) 32.6–34.6, (700) 32.5–34.1

Cell Data: *Space Group:* $A2/m$, $A2$, or Am . $a = 19.96$ $b = 8.057$ $c = 7.809$
 $\beta = 92.08^\circ$ $Z = 2$

X-ray Powder Pattern: Synthetic.

2.813 (100), 5.63 (90), 2.860 (70), 1.959 (70), 2.018 (60), 3.91 (50), 3.456 (50)

Chemistry:	(1)	(2)	(3)
Tl	7.5	5.0	8.02
Ag	8.5	9.0	8.46
Au	22.9	24.7	23.18
Sb	47.7	49.3	47.76
S	13.1	12.7	12.58
Total	99.7	100.71	100.00

(1) Hemlo deposit, Canada; by electron microprobe, average of analyses of five samples; corresponds to $\text{Tl}_{0.92}\text{Ag}_{1.99}\text{Au}_{2.93}\text{Sb}_{9.87}\text{S}_{10.29}$. (2) Vigès deposit, France; by electron microprobe, average of twelve analyses; corresponds to $\text{Tl}_{0.61}\text{Ag}_{2.10}\text{Au}_{3.15}\text{Sb}_{10.18}\text{S}_{9.96}$. (3) $\text{TlAg}_2\text{Au}_3\text{Sb}_{10}\text{S}_{10}$.

Occurrence: A primary hydrothermal mineral in a complex gold deposits.

Association: Aurostibite, gold, antimony, chalcostibite, parapirotite, stibnite, tetrahedrite, molybdenite, zinkenite, pyrite, quartz (Hemlo deposit, Canada); gold, aurostibite (Vigès deposit, France).

Distribution: From the Hemlo gold deposit, Thunder Bay district, Ontario, Canada. In the Vigès Au–Sb deposit, Creuse, France.

Name: To honor Dr. Alan John Criddle (1944–2002), English mineralogist of the British Museum (Natural History), London, England.

Type Material: The Natural History Museum, London, England, 1987,351 and E.1230; Canadian Geological Survey, Ottawa, 65186; Royal Ontario Museum, Toronto, Canada.

References: (1) Harris, D.C., A.C. Roberts, J.H.G. Laflamme, and C.J. Stanley (1988) Criddleite, $\text{TlAg}_2\text{Au}_3\text{Sb}_{10}\text{S}_{10}$, a new gold-bearing mineral from Hemlo, Ontario, Canada. *Mineral. Mag.*, 52, 691–697. (2) (1990) *Amer. Mineral.*, 75, 706 (abs. ref. 1). (3) Gatellier, J.-P., E. Marcoux, and Y. Moëlo (1990) Nouvelle découverte de criddleite dans le district aurifère de Vigès, Massif Central, Creuse, France. *Can. Mineral.*, 28, 739–744 (in France with English abs.).