

Ciriottiite**Cu(Cu, Ag)₃Pb₁₉(Sb, As)₂₂(As₂)S₅₆**

Crystal Data: Monoclinic. *Point Group:* 2/m. As tubular crystals, to 150 μm.

Physical Properties: *Cleavage:* n.d. *Fracture:* n.d. *Tenacity:* Brittle.
Hardness = 3-3.5 VHN = 190-219, 203 (10 g load). D(meas.) = n.d. D(calc.) = 5.918

Optical Properties: Opaque. *Color:* Black; light gray in reflected light. *Streak:* Black.
Luster: Metallic.

Optical Class: n.d. *Anisotropism:* Distinct, brownish to greenish tints.
R₁-R₂: (471.1) 37.8-33.2, (548.3) 35.3-31.8, (586.6) 34.7-31.0, (652.3) 32.5-27.9

Cell Data: Space Group: *P*₂₁/*n*. *a* = 8.178(2) *b* = 28.223(6) *c* = 42.542(5) β = 93.55(2)° *Z* = 4

X-ray Powder Pattern: Calculated pattern.
3.641 (100), 3.238 (82), 2.043 (78), 3.208 (57), 2.936 (54), 2.928 (37), 2.800 (36)

Chemistry:	(1)	(2)
Cu	2.33	2.95
Ag	0.53	
Hg	0.98	
Tl	0.78	
Pb	44.06	45.63
As	4.66	5.21
Sb	23.90	25.40
Bi	1.75	
<u>S</u>	<u>20.37</u>	<u>20.81</u>
Total	99.38	100.00

(1) Espérance superiore tunnel, Piedmont, Italy; average of 5 electron microprobe analyses; corresponds to Cu_{3.23}Ag_{0.43}Hg_{0.43}Pb_{18.74}Tl_{0.34}Sb_{17.30}As_{5.48}Bi_{0.74}S₅₆. (2) Cu(Cu₃)Pb₁₉(Sb₁₈As₄)(As₂)S₅₆.

Mineral Group: Owyheeite group.

Occurrence: In a vug in a quartz vein in a complex hydrothermal sulfide deposit.

Association: Arsenopyrite, a kobellite-like mineral.

Distribution: From the Espérance superiore tunnel, Tavagnasco Pb-Bi-Zn-As-Fe-Cu district, ~50 km north of Turin, Piedmont, Italy.

Name: Honors Marco Ernesto Ciriotti (b. 1945), Italian member of the IMA CNMNC since 2013, and president of the Italian Micromineralogical Association, for his longstanding contributions to mineral systematics.

Type Material: Natural History Museum, University of Florence, Italy (3161/I).

References: (1) Bindi, L., C. Biagioni, B. Martini, and A. Salvetti (2016) Ciriottiite, Cu(Cu,Ag)₃Pb₁₉(Sb,As)₂₂(As₂)S₅₆, the Cu-analogue of sterryite from the Tavagnasco Mining District, Piedmont, Italy. *Minerals*, 6(1), 8. (2) (2020) *Amer. Mineral.*, 105, 1111 (abs. ref. 1).