

Crystal Data: Monoclinic. *Point Group:* 2/m. In euhedral crystals, to 30 μm, tabular and prismatic, with well-developed prisms and pinacoids, perhaps with fluted terminations; may be hollow tubular, capped at one end, and curved; commonly granular, or as coatings.

Physical Properties: *Cleavage:* {010}, perfect; {001}, {100}, very good; {0kl}, {h0l}, and {hk0}, good (synthetic). *Fracture:* Splintery, hackly, conchoidal (synthetic). Hardness = 2-3 (synthetic). VHN = 65-75 D(meas.) = 7.0(1) (synthetic). D(calc.) = 7.130 (synthetic).

Optical Properties: Opaque to translucent. *Color:* Bright yellow-orange to dull orange; on exposure to light immediately darkens through yellow-brown to black; pale gray with yellowish tint in reflected light, with abundant canary-yellow internal reflections. *Streak:* Yellow-orange, blackening on exposure to light. *Luster:* Nearly adamantine (synthetic).

Optical Class: Biaxial (+). $\alpha = > 2.0$ $\beta = > 2.0$ $\gamma = > 2.0$ 2V(meas.) = ~35°

Pleochroism: Bright orange, orange with a rosy tint, or orange with a green tint.

Cell Data: *Space Group:* C2/m (synthetic). $a = 16.827(4)$ $b = 9.117(1)$ $c = 13.165(5)$
 $\beta = 130.17(2)^\circ$ $Z = 8$

X-ray Powder Pattern: McDermitt mine, Nevada, USA.

2.64 (100), 2.71 (44), 3.90 (41), 2.58 (29), 2.53 (28), 2.281 (26), 2.96 (24)

Chemistry:	(1)	(2)
Hg	73.4	72.66
Cl	3.6	4.28
Br	0.0	
I	14.8	15.32
<u>S</u>	<u>8.2</u>	<u>7.74</u>
Total	100.0	100.00

(1) McDermitt mine, Nevada, USA; by electron microprobe, average of ten analyses; corresponds to Hg₃S_{2.10}Cl_{0.82}I_{0.96}. (2) Hg₃S₂ClI.

Occurrence: In tuffaceous rhyolitic lake-bed sediments, formed as a reaction product between halide-bearing hydrothermal solutions and cinnabar or corderoite.

Association: Cinnabar, corderoite, quartz, gypsum.

Distribution: In the McDermitt mercury mine, Opalite district, Humboldt Co., Nevada, USA.

Name: Honors Arthur Sears *Radtke* (1936-2004), American mineralogist and geochemist, U.S. Geological Survey, Palo Alto, California, USA.

Type Material: Mackay School of Mines, University of Nevada, Reno, Nevada; National Museum of Natural History, Washington, D.C., USA, 168450.

References: (1) McCormack, J.K., F.W. Dickson, and M.P. Leshendok (1991) Radtkeite, Hg₃S₂ClI, a new mineral from the McDermitt mercury deposit, Humboldt County, Nevada. *Amer. Mineral.*, 76, 1715-1721. (2) Pervukhina, N.V., V.I. Vasil'ev, D.Yu. Naumov, S.V. Borisov, and S.A. Magarill (2004) The crystal structure of synthetic radtkeite, Hg₃S₂ClI. *Can. Mineral.*, 42, 87-94. (3) (2004) *Amer. Mineral.*, 89(12), 1833 (abs. ref. 2).