Radtkeite Hg_3S_2ClI

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 (+). α = > 2.0 β = > 2.0 γ = > 2.0 2V(meas.) = ~35°
Pleochroism: Bright orange, orange with a rosy tint, or orange with a green tint.

Cell Data: *Space Group*: *C*2/*m* (synthetic). a = 16.827(4) b = 9.117(1) c = 13.165(5)
β = 130.17(2)° 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
S	8.2	7.74
Total	100.0	100.00

(1) McDermitt mine, Nevada, USA; by electron microprobe, average of ten analyses; corresponds to $Hg_3S_{2.10}Cl_{0.82}I_{0.96}$. (2) Hg_3S_2ClI.

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, Hg_3S_2ClI, 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, Hg_3S_2ClI. Can. Mineral., 42, 87-94. (3) (2004) Amer. Mineral., 89(12), 1833 (abs. ref. 2).