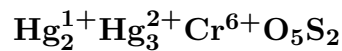


Deanesmithite



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Crystal Data: Triclinic. *Point Group:* $\bar{1}$. As bladed to tabular {100} crystals, dominated by {100}, with minor {320}, {001}, $\{\bar{5}10\}$, $\{01\bar{1}\}$, and a dozen other forms, to 0.5 mm; striations on {100} || [001]; typically in radiating clusters and fan-shaped aggregates. *Twinning:* Indicated in reflected light.

Physical Properties: *Cleavage:* Good on $\{\bar{1}10\}$; fair on {001}. *Fracture:* Irregular to subconchoidal. *Tenacity:* Brittle to friable. Hardness = < 5 D(meas.) = n.d. D(calc.) = 8.06

Optical Properties: Transparent. *Color:* Red-orange; dark bluish gray to pale gray with bright yellow-orange internal reflections in reflected light. *Streak:* Less intense red-orange. *Luster:* Adamantine.

Optical Class: Biaxial. *Pleochroism:* Weak; yellow-orange to dark reddish orange.

Birefractance: Weak.

R_1 – R_2 : (400) 24.8–23.1, (420) 25.2–23.1, (440) 24.8–23.15, (460) 23.8–23.3, (480) 22.9–23.6, (500) 22.1–23.8, (520) 21.3–23.5, (540) 20.5–22.9, (560) 20.1–22.05, (580) 20.0–21.7, (600) 20.0–21.55, (620) 19.9–21.3, (640) 19.7–21.0, (660) 19.6–20.8, (680) 19.4–20.45, (700) 19.25–20.3

Cell Data: *Space Group:* $P\bar{1}$. $a = 8.1287(8)$ $b = 9.4916(7)$ $c = 6.8940(4)$
 $\alpha = 100.356(6)^\circ$ $\beta = 110.163(7)^\circ$ $\gamma = 82.981(8)^\circ$ $Z = 2$

X-ray Powder Pattern: Clear Creek claim, California, USA.

3.008 (100), 5.72 (90), 3.373 (60), 2.425 (60), 2.864 (50b), 2.774 (50), 2.536 (50)

Chemistry:

	(1)	(2)
CrO ₃	8.6	8.34
HgO	[54.4]	54.19
Hg ₂ O	[34.9]	34.79
S	5.3	5.35
–O = S	2.6	2.67
Total	[100.6]	100.00

(1) Clear Creek claim, California, USA; by electron microprobe, average of six analyses; after recalculation with Hg₂O and HgO in the ratio 2:3, confirmed by crystal-structure analysis, corresponds to Hg_{1.98}¹⁺Hg_{2.97}²⁺Cr_{1.02}⁶⁺O_{5.05}S_{1.95}. (2) Hg₂¹⁺Hg₃²⁺CrO₅S₂.

Occurrence: Very rare in a mercury deposit in silicate–carbonate rock hydrothermally altered from serpentinite.

Association: Cinnabar, edoylerite.

Distribution: From the Clear Creek claim, near the Clear Creek mercury mine, New Idria district, San Benito Co., California, USA.

Name: Honors Professor Deane Kingsley Smith, Jr. (1930–2001), Pennsylvania State University, University Park, Pennsylvania, USA, for his contributions to structural and experimental mineralogy.

Type Material: Canadian Geological Survey, Ottawa, Canada, 65026, 66152.

References: (1) Roberts, A.C., J.T. Szymański, R.C. Erd, A.J. Criddle, and M. Bonardi (1993) Deanesmithite, Hg₂¹⁺Hg₃²⁺Cr⁶⁺O₅S₂, a new mineral species from the Clear Creek Claim, San Benito County, California. *Can. Mineral.*, 31, 787–793. (2) Szymański, J.T. and L.A. Groat (1997) The crystal structure of deanesmithite, Hg₂¹⁺Hg₃²⁺Cr⁶⁺O₅S₂. *Can. Mineral.*, 35, 765–772.