

# Gerstleyite

# Na<sub>2</sub>(Sb, As)<sub>8</sub>S<sub>13</sub>•2H<sub>2</sub>O

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**Crystal Data:** Monoclinic. *Point Group:* *m*. As spherules with a fibrous to platy structure, to 2.5 cm; also as fine granular aggregates and groups of small thick plates.

**Physical Properties:** *Cleavage:* Perfect on {010} and {100}; poor on {001}. Hardness = 2.5 VHN = n.d. D(meas.) = 3.62 D(calc.) = 3.723

**Optical Properties:** Transparent. *Color:* Cinnabar-red. *Streak:* Bright cinnabar-red; powder darkens on exposure. *Luster:* Weakly adamantine.

*Optical Class:* [Biaxial.] *Pleochroism:* Weak; X = salmon-red; Y = Z = deep blood-red.

*n* = > 2.01

R<sub>1</sub>-R<sub>2</sub>: n.d.

**Cell Data:** *Space Group:* *Cm*. *a* = 9.911(8) *b* = 23.05(2) *c* = 7.097(8) *β* = 127.85(7)°  
Z = 2

**X-ray Powder Pattern:** Baker mine, California, USA.

11.85 (100), 3.05 (90), 5.64 (70), 4.03 (70), 2.81 (50), 2.739 (40), 1.934 (40)

## Chemistry:

	(1)	(2)	(3)
Na	4.28	4.65	3.29
Li	0.135	0.15	
Sb	47.80	51.91	55.74
As	7.38	8.02	8.57
S	27.01	29.33	29.82
H <sub>2</sub> O	5.47	5.94	2.58
gangue	n.d.		
Total	92.07	100.00	100.00

(1) Baker mine, California, USA. (2) Analysis (1) recalculated to 100% after deduction of gangue 8%, corresponds to (Na<sub>2.87</sub>Li<sub>0.31</sub>)<sub>Σ=3.18</sub>(Sb<sub>6.06</sub>As<sub>1.52</sub>)<sub>Σ=7.58</sub>S<sub>13.00</sub>•4.68H<sub>2</sub>O.

(3) Na<sub>2</sub>(Sb, As)<sub>8</sub>S<sub>13</sub>•2H<sub>2</sub>O with Sb:As = 4:1.

**Occurrence:** A low-temperature mineral found embedded in massive borates and clay.

**Association:** Borax, probertite, tincalconite, realgar, stibnite.

**Distribution:** In the USA, from the Baker mine, Kramer borate deposit, Boron, Kern Co., California [TL].

**Name:** Honors James Mack Gerstley (1907– ), President of the Pacific Coast Borax Company.

**Type Material:** Harvard University, Cambridge, Massachusetts, 111307; National Museum of Natural History, Washington, D.C., USA, 106916.

**References:** (1) Frondel, C. and V. Morgan (1956) Inderite and gerstleyite from the Kramer borate district, Kern County, California. *Amer. Mineral.*, 41, 839–843. (2) Nakai, I. and D.E. Appleman (1981) The crystal structure of gerstleyite Na<sub>2</sub>(Sb, As)<sub>8</sub>S<sub>13</sub>•2H<sub>2</sub>O: the first sulfosalt mineral of sodium. *Chem. Lett.*, 10, 1327–1330. (3) (1981) *Chem. Abs.*, 95, 195617 (abs. ref. 2).