Segerstromite $Ca_3(As^{5+}O_4)_2[As^{3+}(OH)_3]_2$

Crystal Data: Cubic. *Point Group*: 23. As tetrahedra, dodecahedra to 0.50 mm, or in blocky aggregates.

Physical Properties: *Cleavage*: None. *Fracture*: n.d. *Tenacity*: Brittle.
Hardness = ~4.5 D(meas.) = 3.44(3) D(calc.) = 3.46

Optical Properties: Transparent. *Color*: Colorless. *Streak*: White. *Luster*: Vitreous.
Optical Class: Isotropic. $n = 1.731(5)$

Cell Data: Space Group: $I\,2_13$. $a = 10.7627(2)$ Z = 4

X-ray Powder Pattern: Cobriza mine, Sacramento district, Copiapó Province, Chile.
2.875 (100), 3.389 (82), 2.111 (45), 4.351 (34), 1.748 (34), 3.104 (33), 1.905 (27)

Chemistry:

	(1)	(2)
CaO	25.57	25.88
As_2O_3	[30.38]	30.44
As_2O_5	[35.20]	35.36
H_2O	[8.29]	8.32
Total	99.53	100.00

(1) Cobriza mine, Sacramento district, Copiapó Province, Chile; average of 16 electron microprobe analyses supplemented by Raman spectroscopy, H_2O calculated from structure and As^{3+}/As^{5+} apportioned from structure and total $As_2O_3 = 60.75$; corresponds to $Ca_{2.98}(AsO_4)_{2.00}[As(OH)_3]_{2.00}$.
(2) $Ca_3(As^{5+}O_4)_2[As^{3+}(OH)_3]_2$.

Occurrence: A secondary mineral in a Pb-Ag-As-Cu-Zn deposit hosted in sedimentary and volcanic rocks.

Association: Talmessite, vladimirite, Sr-bearing hydroxylapatite.

Distribution: From the Cobriza mine, Sacramento district, Copiapó Province, Atacama Region, Chile.

Name: Honors Kenneth Segerstrom (1909-1992), geologist for the U.S. Geological Survey in the U.S., Mexico, and Chile, conducting field-based regional geologic studies. Segerstrom worked in Chile in conjunction with the "Instituto de Investigaciones Geologicas" (now Sernageomin), from 1957-1963, mainly in the Atacama Region, including the Sacramento district and the Cobriza mine.

Type Material: University of Arizona Mineral Museum (19800) and the RRUFF Project (R130753), Tucson, Arizona, USA.

References: (1) Yang, H., R.T. Downs, R.A. Jenkins, and S.H. Evans (2018) Segerstromite, $Ca_3(As^{5+}O_4)_2[As^{3+}(OH)_3]_2$, the first mineral containing $As^{3+}(OH)_3$, the arsenite molecule, from the Cobriza mine in the Atacama Region, Chile. Amer. Mineral., 103(9), 1497-1501.