Cardite $Zn_{5.5}(AsO_4)_2(AsO_3OH)(OH)_3 \cdot 3H_2O$

Crystal Data: Orthorhombic. *Point Group*: 2/*m* 2/*m* 2/*m*. As radiating sprays to 0.25 mm of acicular to bladed crystals to 0.09 mm.

Physical Properties: *Cleavage*: n.d. *Tenacity*: Brittle. *Fracture*: Uneven. Hardness = n.d. D(meas.) = n.d. D(calc.) = 4.02 Nonfluorescent.

Optical Properties: Translucent. *Color*: White to pinkish white and pale tan. *Streak*: White. *Luster*: Vitreous
Optical Class: Biaxial. *n*(meas.) = 1.678(4) *n*(calc.) = 1.707

Cell Data: *Space Group*: *Cmcm*. *a* = 15.110(3) *b* = 15.492(3) *c* = 6.3850(13) Z = 4

X-Ray Diffraction Pattern: Block 14 Opencut, Broken Hill, New South Wales, Australia. 10.783 (100), 7.564 (85), 4.143 (48), 3.328 (31), 2.763 (31), 2.668(24), 2.451(21)

Chemistry:

	(1)	(2)
ZnO	43.39	50.72
CdO	7.26	
CoO	1.24	
MnO	0.59	
FeO	0.12	
As_2O_5	38.84	39.07
SO_3	0.20	
H_2O	[9.97]	10.21
Total	101.61	100.00

(1) Block 14 Opencut, Broken Hill, New South Wales, Australia; average electron microprobe analysis supplemented by IR spectroscopy, H_2O calculated for charge balance; corresponding to $(Zn_{4.75},Cd_{0.50},Co_{0.15},Mn_{0.07},Fe_{0.01})_{5.48}[(AsO_4)_{2.01}(SO_4)_{0.02}]_{2.03}(AsO_3OH)(OH)_{2.89} \cdot 2.98H_2O$.
(2) $Zn_{5.5}(AsO_4)_2(AsO_3OH)(OH)_3 \cdot 3H_2O$.

Occurrence: A secondary mineral from a sulfide zone with leached sulfide minerals in a weathered Pb-Zn ore deposit.

Association: Anglesite, pyromorphite, köttigite.

Distribution: From the mine dumps of the Block 14 Opencut, Broken Hill, New South Wales, Australia.

Name: Honors George William *Card* (1865-1943), petrologist and mineralogist with the Geological Survey of New South Wales and a Curator of the Mining Museum in Sydney (1893-1927).

Type Material: South Australian Museum, Adelaide, Australia (G34301).

References: (1) Elliott, P. (2021) Cardite, $Zn_{5.5}(AsO_4)_2(AsO_3OH)(OH)_3 \cdot 3H_2O$, a new zinc arsenate mineral from Broken Hill, New South Wales, Australia. Mineralogy and Petrology, 115(4), 467-475. (2) (2021) Amer. Mineral., 106, 2030 (abs. ref. 1).