Edwardsite $Cu_3Cd_2(SO_4)_2(OH)_6 \cdot 4H_2O$

Crystal Data: Monoclinic. *Point Group*: 2/*m*. As tabular to bladed crystals, to 0.06 mm, flattened on {100}, elongated on [010], showing forms {100}, {001}, {010} and perhaps {043}; as druses.

Physical Properties: *Cleavage*: Excellent on {100}. *Fracture*: Uneven. *Tenacity*: Brittle. Hardness = 3-3.5 D(meas.) = n.d. D(calc.) = 3.53

Optical Properties: Transparent. *Color*: Pale blue. *Streak*: White.
Luster: Vitreous.
Optical Class: Biaxial (-). $\alpha = \sim 1.74$ $\beta = 1.762(4)$ $\gamma = \sim 1.77$ 2V(calc.) = $\sim 62°$
Orientation: X = *b*; Y ~ *a*; Z ~ *c*.

Cell Data: *Space Group*: $P2_1/c$. $a = 10.863(2)$ $b = 13.129(3)$ $c = 11.169(2)$
$\beta = 113.04(3)°$ Z = 4

X-ray Powder Pattern: Block 14 Opencut, Broken Hill, New South Wales, Australia.
9.991 (90), 5.001 (90), 3.332 (60), 2.769 (55), 4.591 (45), 2.670 (45), 2.824 (40)

Chemistry:

	(1)	(2)
CdO	32.43	32.85
CuO	28.06	30.53
ZnO	2.26	
FeO	0.08	
SO_3	20.35	20.48
$H_2O_{calc.}$	16.14	16.14
Total	99.32	100.00

(1) Block 14 Opencut, Broken Hill, New South Wales, Australia; average of 10 electron microprobe analyses, H_2O calculated from structure analysis, OH and SO_4 confirmed by IR, corresponding to $Cu_{2.77}Cd_{1.98}Zn_{0.22}Fe_{0.01}(SO_4)_{2.00}(OH)_{5.95} \cdot 4.06H_2O$. (2) $Cu_3Cd_2(SO_4)_2(OH)_6 \cdot 4H_2O$.

Occurrence: A secondary mineral in the oxidized portion of a Ag-Pb-Zn metal deposit.

Association: Niedermayrite, christelite.

Distribution: Block 14 Opencut, Broken Hill, New South Wales, Australia.

Name: Honors Dr. Austin Burton Edwards (1909–1960), mineralogist and petrologist in the Mineragraphic Section of the Council for Scientific and Industrial Research CSIRO), Melbourne, Australia, for his contributions to the study of Australian ore deposits such as Broken Hill.

Type Material: South Australian Museum, Adelaide, South Australia (catalog no. G32703).

References: (1) Elliott, P., J. Brugger, and T. Caradoc-Davies (2010) Description and crystal structure of a new mineral, edwardsite, $Cu_3Cd_2(SO_4)_2(OH)_6 \cdot 4H_2O$, from Broken Hill, New South Wales, Australia. Mineral. Mag., 74, 39–54. (2) (2010) Amer. Mineral., 95, 1597-1598 (abs. ref. 1).