Niedermayrite $Cu_4Cd(SO_4)_2(OH)_6 \cdot 4H_2O$

Crystal Data: Monoclinic. *Point Group:* $2/m$. Crystals, to 50 μm, flattened ‖ {010}, with {100}, {001}, {hk0}, in crusts.

Physical Properties: *Cleavage:* Perfect on {010}. *Tenacity:* Brittle. Hardness = n.d. D(meas.) = n.d. D(calc.) = 3.29

Optical Properties: Semitransparent. *Color:* Bluish green. *Streak:* White. *Luster:* Vitreous.
Optical Class: Biaxial (–). *Orientation:* $X = b$. *Dispersion:* $r > v$, strong. α = [1.599–1.619] $\beta = 1.642(2)$ $\gamma = 1.661(2)$ 2V(meas.) = 66°–84°

Cell Data: *Space Group:* $P2_1/m$. $a = 5.543(1)$ $b = 21.995(4)$ $c = 6.079(1)$ $\beta = 92.04(1)°$ Z = 2

X-ray Powder Pattern: Laurium, Greece.
5.496 (100), 11.02 (90), 4.079 (50), 3.243 (40), 3.437 (30), 2.470 (30), 5.322 (25)

Chemistry:

	(1)	(2)
SO_3	21.6	21.85
MnO	< 0.1	
CuO	45.7	43.42
CdO	16.5	17.52
ZnO	< 0.1	
H_2O	[16.2]	17.21
Total	[100.0]	100.00

(1) Laurium, Greece; by electron microprobe, average of seven analyses, H_2O by difference, 18.9% by TGA; corresponds to $Cu_{4.29}Cd_{0.96}(SO_4)_{2.01}(OH)_{6.50} \cdot 3.46H_2O$. (2) $Cu_4Cd(SO_4)_2(OH)_6 \cdot 4H_2O$.

Occurrence: Very rare in the oxidation zone of a zinc-rich hydrothermal orebody in brecciated marble, formed as an alteration product of chalcopyrite and greenockite.

Association: Gypsum, malachite, chalcanthite, brochantite, hemimorphite, hydrozincite, aurichalcite, monteponite, otavite, sphalerite, greenockite, hawleyite, pyrite, galena.

Distribution: From Laurium, Greece.

Name: To honor Dr. Gerhard Niedermayr (1941–), Curator, Natural History Museum, Vienna, Austria.

Type Material: Natural History Museum, Vienna; Institute for Mineralogy and Crystallography, Vienna University, Vienna, Austria.

References: (1) Giester, G., B. Rieck, and F. Brandstätter (1998) Niedermayrite, $Cu_4Cd(SO_4)_2(OH)_6 \cdot 4H_2O$, a new mineral from the Lavrion mining district, Greece. Mineral. Petrol., 63, 19–34. (2) (1999) Amer. Mineral., 84, 686 (abs. ref. 1).