Lotharmeyerite $CaZn_2(AsO_4)_2 \cdot 2H_2O$

Crystal Data: Monoclinic. *Point Group*: 2/*m*, *m*, or 2. As equant to tapering bladelike crystals, elongated along [010], showing {001}, curved {101}, {201}, terminated by {110} and {111}, to 6 mm; in crystalline druses. *Twinning*: About [h0l], probable.

Physical Properties: *Cleavage*: On {001}, good. Hardness = ~3 D(meas.) = 4.23(5) D(calc.) = 4.21-4.29

Optical Properties: Semitransparent. *Color*: Dark reddish orange. *Streak*: Pale orange to yellow-orange. *Luster*: Vitreous.
Optical Class: Biaxial (+). α = 1.797(5) β = 1.804(5) γ = 1.815(5) 2V(meas.) = ~80°
Pleochroism: Strong; *X* = *Z* = yellow-orange; *Y* = red-brown. *Orientation*: *Y* = *b*; *Z* ∧ *c* = -40°.
Dispersion: *r* >> *v*, strong, inclined. *Absorption*: *Y* >> *X* > *Z*.

Cell Data: *Space Group*: *C*2/*m*, *Cm*, or *C*2. *a* = 9.066(4) *b* = 6.276(2) *c* = 7.408(2) β = 116.16(3)° Z = 2

X-ray Powder Pattern: Ojuela mine, Mapimí, Mexico.
2.557 (100), 3.414 (90), 3.175 (90), 2.912 (90), 4.94 (80), 2.822 (80), 2.710 (80)

Chemistry:

	(1)	(2)
As_2O_5	45.7	47.0
Fe_2O_3	2.7	
Mn_2O_3	13.4	18.7
ZnO	18.3	14.2
CaO	11.3	11.4
H_2O	[8.6]	8.4
Total	[100.0]	99.7

(1) Ojuela mine, Mapimí, Mexico; by electron microprobe, total Fe as Fe_2O_3, total Mn as Mn_2O_3, H_2O by difference; corresponds to $Ca_{0.96}(Zn_{1.07}Mn_{0.81}Fe_{0.16})_{\Sigma=2.04}(AsO_4)_{1.89}(OH,H_2O)_2$. (2) Do.; by electron microprobe, total Mn as Mn_2O_3, H_2O by moisture evolution analyzer.

Mineral Group: Tsumcorite group, lotharmeyerite subgroup.

Occurrence: In the oxidized zone of an arsenic-rich polymetallic base-metal deposit.

Association: Adamite, cryptomelane, chalcophanite, goethite.

Distribution: From the Ojuela mine, Mapimí, Durango, Mexico.

Name: Honors Julius *Lothar Meyer* (1830-1895), German chemist and physician, Karlsruhe Polytechnic Institute and University of Tübingen, Germany, for his contributions to chemistry.

Type Material: National Museum of Natural History, Washington, D.C., USA (149482).

References: (1) Dunn, P.J. (1983) Lotharmeyerite, a new mineral from Mapimi, Durango, Mexico. Mineral. Record, 14, 35-36. (2) (1983) Amer. Mineral., 68, 849 (abs. ref. 1). (3) Kampf, A.R., J.E. Shigley, and G.R. Rossman (1984) New data on lotharmeyerite. Mineral. Record, 15, 223-226. (4) Krause, W., K. Belendorff, H.-J. Bernhardt, C. McCammon, H. Effenberger, and W. Mikenda (1998) Crystal chemistry of the tsumcorite-group minerals. New data on ferrilotharmeyerite, tsumcorite, thometzekite, mounanaite, helmutwinklerite, and a redefinition of gartrellite. Eur. J. Mineral., 10, 179-206. (5) Brugger, J., S.V. Krivovichev, U. Kolitsch, N. Meisser, M. Andrut, S. Ansermet, and P.C. Burns (2002) Description and crystal structure of manganlotharmeyerite, $Ca(Mn^{3+},\square,Mg)_2\{AsO_4,[AsO_2(OH)_2]\}_2(OH,H_2O)_2$, from the Starlera Mn deposit, Swiss Alps, and a redefinition of lotharmeyerite. Can. Mineral., 40, 1597-1608. (6) (2003) Amer. Mineral., 88, 1627 (abs. ref. 5).