

Lotharmeyerite

Ca(Mn³⁺, Zn)₂(AsO₄)₂(OH, H₂O)₂

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Crystal Data: Monoclinic. *Point Group:* $2/m$, m , or 2 . As equant to tapering bladelike crystals, elongated along [010], showing {001}, curved {10 $\bar{1}$ }, {20 $\bar{1}$ }, terminated by {110} and {111}, to 6 mm; in crystalline druses. *Twining:* 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 (+). *Pleochroism:* Strong; $X = Z$ = yellow-orange; Y = red-brown.

Orientation: $Y = b$; $Z \wedge c = -40^\circ$. *Dispersion:* $r \gg v$, strong, inclined. *Absorption:* $Y \gg X > Z$.
 $\alpha = 1.797(5)$ $\beta = 1.804(5)$ $\gamma = 1.815(5)$ $2V(\text{meas.}) = \sim 80^\circ$

Cell Data: *Space Group:* $C2/m$, Cm , or $C2$. $a = 9.066(4)$ $b = 6.276(2)$ $c = 7.408(2)$
 $\beta = 116.16(3)^\circ$ $Z = 2$

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 ₂ O ₅ | 45.7 | 47.0 |
| Fe ₂ O ₃ | 2.7 | |
| Mn ₂ O ₃ | 13.4 | 18.7 |
| ZnO | 18.3 | 14.2 |
| CaO | 11.3 | 11.4 |
| H ₂ O | [8.6] | 8.4 |
| Total | [100.0] | 99.7 |

(1) Ojuela mine, Mapimí, Mexico; by electron microprobe, total Fe as Fe₂O₃, total Mn as Mn₂O₃, H₂O by difference; corresponds to Ca_{0.96}(Zn_{1.07}Mn_{0.81}Fe_{0.16})_{Σ=2.04}(AsO₄)_{1.89}(OH, H₂O)₂.

(2) Do.; by electron microprobe, total Mn as Mn₂O₃, H₂O by moisture evolution analyzer.

Mineral Group: Tsumcorite group.

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: To honor 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.