

Crystal Data: Orthorhombic. *Point Group:* 2/m 2/m 2/m. As prismatic, acicular crystals striated along elongation, with rhombic cross-sections, up to 0.5 mm, and displaying {210}, {110}, {010}, {011}, and {111}.

Physical Properties: *Cleavage:* None. *Fracture:* Uneven. *Tenacity:* n.d. *Hardness* = ~ 3 VHN = 154(5) (25 g load). *D(meas.)* = n.d. *D(calc.)* = 4.66

Optical Properties: Opaque. *Color:* Black, gray in reflected light. *Streak:* Black.

Luster: Sub-metallic.

Optical Class: Weak pleochroism, bireflectance and anisotropy.

R₁-R₂: (470) 28.1-19.8, (546) 25.7-19.0, (589) 25.0-19.1, (650) 24.3-19.0

Cell Data: *Space Group:* Pnma. *a* = 9.0548(2) *b* = 2.8718(1) *c* = 10.9908(2) *Z* = 8/3

X-ray Powder Pattern: Bellerberg volcano, Eifel, Rhineland-Palatinate, Germany. 2.646 (100), 2.450 (77), 2.748 (62), 4.527 (54), 4.698 (44), 1.818 (43), 2.425 (37)

Chemistry:	(1)
Al ₂ O ₃	0.27
Fe ₂ O ₃	27.97
MnO ₂	29.52
Mn ₂ O ₃	22.97
MgO	0.40
CaO	18.48
Total	99.61

(1) Bellerberg volcano, Eifel, Rhineland-Palatinate, Germany; average of 9 electron microprobe analyses supplemented by Raman spectroscopy, Mn⁴⁺/Mn³⁺ calculated for charge balance; corresponds to Ca_{0.99}(Fe³⁺_{1.06}Mn⁴⁺_{1.03}Mn³⁺_{0.88}Mg_{0.03}Al_{0.02})_{Σ=3.01}O₆.

Polymorphism & Series: Forms a solid solution series with harmunite.

Occurrence: A late-stage mineral formed during retrograde metamorphism of strongly altered xenoliths within alkaline basalt.

Association: Ettringite-thaumasite, hydrocalumite, jennite, katoite, portlandite, magnesioferrite, perovskite.

Distribution: From the Bellerberg volcano (Caspar quarry), Ettringen near Mayen, Eifel, Rhineland-Palatinate, Germany.

Name: Honors Dr. Werner Krause (b. 1949), a chemist with a special interest in the crystal chemistry and morphology of secondary minerals, many new species of which he discovered.

Type Material: Museum of Natural History, Bern, Switzerland (NMBE 42804).

References: (1) Galuskin, E.V., B. Krüger, H. Krüger, G. Blass, R. Widmer, and I.O. Galuskina (2016) Wernerkrauseite, CaFe³⁺₂Mn⁴⁺O₆: the first nonstoichiometric post-spinel mineral, from Bellerberg volcano, Eifel, Germany. *Eur. J. Mineral.*, 28(2), 485-493. (2) (2016) *Amer. Mineral.*, 101, 2783-2784 (abs. ref. 1).