

Crystal Data: Monoclinic. *Point Group:* $2/m$. In thin crusts and earthy aggregates.

Physical Properties: *Fracture:* Uneven. Hardness = ~ 2 D(meas.) = n.d. D(calc.) = 2.41 (synthetic $\text{ZnSO}_4 \cdot 4\text{H}_2\text{O}$). Soluble in H_2O ; slowly alters to gunningite in a dry atmosphere.

Optical Properties: Semitransparent. *Color:* White. *Streak:* White.
Optical Class: Biaxial (-). $\alpha = 1.522(2)$ $\beta = [1.531]$ $\gamma = 1.536(2)$ $2V(\text{meas.}) = \sim 70^\circ$

Cell Data: *Space Group:* $P2_1/n$ (synthetic $\text{ZnSO}_4 \cdot 4\text{H}_2\text{O}$). $a = 5.95$ $b = 13.60$ $c = 7.96$
 $\beta = 90^\circ 18'$ $Z = 4$

X-ray Powder Pattern: Kropbach quarry, Germany.
5.46 (10), 4.47 (10), 6.85 (8), 3.96 (8), 3.39 (7), 2.95 (7), 2.55 (5)

Chemistry:	(1)
	SO ₃ 38.89
	ZnO 33.09
	MgO 3.19
	H ₂ O 24.83
	<hr/>
	Total [100.00]

(1) Kropbach quarry, Germany; recalculated after deduction of estimated gypsum 11.60%, then corresponding to $(\text{Zn}_{0.84}\text{Mg}_{0.16})\text{SO}_4 \cdot 4\text{H}_2\text{O}$.

Mineral Group: Rozenite group.

Occurrence: A rare alteration product of sphalerite in a hydrothermal Pb–Zn vein (Kropbach quarry, Germany).

Association: Gypsum, gunningite, sphalerite (Kropbach quarry, Germany); gunningite, coquimbite, zincocopiapite, jarosite, melanterite, römerite, siderotil, voltaite, chalcantite, hexahydrate, gypsum (Les Vallettes, Switzerland).

Distribution: From the Kropbach quarry, Müntertal, Black Forest, Germany. At Les Vallettes, Valais, Switzerland. From Keno Hill, Yukon Territory, Canada.

Name: Honoring Dr. Robert William Boyle (1920–), Canadian geochemist, Geological Survey of Canada, Ottawa, Canada.

Type Material: National Museum of Natural History, Washington, D.C., USA, 137413.

References: (1) Walenta, K. (1978) Boyleit, ein neues Sulfatmineral von Kropbach im südlichen Schwarzwald. Chem. Erde. 37, 73–79 (in German with English abs.). (2) (1979) Amer. Mineral., 64, 241, 464 (abs. ref. 1).