Picromerite $K_2Mg(SO_4)_2 \cdot 6H_2O$

Crystal Data: Monoclinic. *Point Group:* $2/m$. Equant crystals, to 5 cm, showing {001}, {010}, {100}, {110}, {011}, {$\bar{2}$01}, {$\bar{1}$11}, several other forms; incrusting other salts; massive.

Physical Properties: *Cleavage:* On {$\bar{2}$01}, perfect (synthetic). Hardness = 2.5 D(meas.) = 2.028 (synthetic). D(calc.) = 2.031 Soluble in H_2O, taste bitter.

Optical Properties: Transparent. *Color:* Colorless or white; pale red, pale yellow, gray due to impurities; colorless in transmitted light. *Luster:* Vitreous.
Optical Class: Biaxial (+). *Orientation:* $Y = b$; $X \wedge a = -1°$. *Dispersion:* $r > v$, weak.
$\alpha = 1.461$ $\beta = 1.463$ $\gamma = 1.476$ 2V(meas.) = 47°54′

Cell Data: *Space Group:* $P2_1/a$ (synthetic). $a = 9.066$ $b = 12.254$ $c = 6.128$
$\beta = 104°47'$ Z = 2

X-ray Powder Pattern: Synthetic.
3.71 (100), 4.06 (95), 4.16 (85), 3.06 (70), 2.964 (60), 3.16 (40), 2.813 (40)

Chemistry:

	(1)	(2)
SO_3	39.74	39.76
MgO	10.40	10.01
K_2O	23.28	23.39
Cl	0.28	
H_2O	26.87	26.84
$-O = Cl_2$	[0.06]	
Total	[100.51]	100.00

(1) Leopoldshall, Germany. (2) $K_2Mg(SO_4)_2 \cdot 6H_2O$.

Mineral Group: Picromerite group.

Occurrence: Principally occurs in oceanic bedded salt deposits; a volcanic sublimate in fumaroles; in a sulfate-rich hydrothermal ore deposit.

Association: Halite, anhydrite, kainite, epsomite (oceanic salt deposits); hohmannite, metavoltine, metasideronatrite (Chuquicamata, Chile).

Distribution: From Vesuvius, Campania, Italy. In Germany, in Saxony-Anhalt, from the Leopoldshall-Stassfurt district, and at Aschersleben; large crystals from the Ellers mine, Neuhof, near Fulda, Hessen; in the Adolfsglück mine, Schwarmstedt, Lower Saxony. At Kalusz, Stebnyk, and Golyn, Ukraine. From Whitby, Yorkshire, England. At volcanoes on the Kamchatka Peninsula, Russia. From the Qarhan salt lake, Qinghai Province, China. At Chuquicamata, Antofagasta, Chile.

Name: From the Greek for *bitter* and *part*, in allusion to the magnesium in its composition.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 453–454. (2) Carapezza, M. and L. Riva di Sanseverino (1970) Crystallography and genesis of double sulfates and their hydrates. III. Picromerite, $K_2Mg(SO_4)_2 \cdot 6H_2O$: a methodological check. Mineral. Petrog. Acta, 16, 5–11. (3) (1970) NBS Mono. 25, 8.