Langbeinite $K_2Mg_2(SO_4)_3$

Crystal Data: Cubic. *Point Group:* 23. Crystals are rare, to 2 cm, equant {100}, {111}, {$\bar{1}$11}, many other modifying forms; in nodules, disseminated granular, typically bedded massive.

Physical Properties: *Fracture:* Conchoidal. *Tenacity:* Brittle. Hardness = 3.5–4
D(meas.) = 2.83 D(calc.) = 2.77 Slowly soluble in H_2O; piezoelectric.

Optical Properties: Transparent *Color:* Colorless, may be pale shades of yellow, pink, red, green, gray; colorless in transmitted light. *Luster:* Vitreous.
Optical Class: Isotropic. n = 1.5329–1.5347

Cell Data: *Space Group:* $P2_13$. a = 9.919(2) Z = 4

X-ray Powder Pattern: Synthetic.
3.137 (100), 2.651 (35), 4.051 (25), 2.992 (16), 2.753 (16), 2.405 (12), 1.609 (12)

Chemistry:

	(1)	(2)
SO_3	57.99	57.87
MgO	19.91	19.43
K_2O	22.72	22.70
Total	100.62	100.00

(1) Hall, Austria. (2) $K_2Mg_2(SO_4)_3$.

Occurrence: A principal ore of potash, mined from marine salt deposits.

Association: Carnallite, halite, sylvite.

Distribution: In Germany, from Wilhelmshall, near Halberstadt; at Solvayhall, near Bernberg; from Hattord, Hesse; and elsewhere. At Hall and Hallstatt, Austria. From Stebnyk, near Drogobych, Ukraine. At Sleights, Eskdale, Yorkshire, England. In the Mayo mine, Salt Range, Punjab, India. From the Qarhan salt lake, Qinghai Province, and the "Q" Basin [Jianghan Plain] potash deposits, Hubei Province, China. In the USA, in New Mexico, in commercial quantities in the Carlsbad potash district, Eddy Co.

Name: To honor A. Langbein, of Leopoldshall [Stassfurt], Germany.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 434–435. (2) Mereiter, K. (1979) Refinement of the crystal structure of langbeinite, $K_2Mg_2(SO_4)_3$. Neues Jahrb. Mineral., Monatsh., 182–188. (3) (1968) NBS Mono. 25, 40–41.