

Langite

$\text{Cu}_4(\text{SO}_4)(\text{OH})_6 \cdot 2\text{H}_2\text{O}$

©2001-2005 Mineral Data Publishing, version 1

Crystal Data: Monoclinic, pseudo-orthorhombic or pseudohexagonal. *Point Group:* *m*. Crystals, showing {001}, {010}, {100}, {110}, {021}, to 7 mm, commonly skeletal; in wavy to flat crusts, earthy, massive. *Twinning:* On {110}, typically repeated to give snowflake-like or star-shaped groupings.

Physical Properties: *Cleavage:* On {001} and {010}. *Hardness* = 2.5–3
D(meas.) = 3.28–3.34 D(calc.) = 3.26–3.37

Optical Properties: Translucent. *Color:* Deep blue, greenish blue, blue-green.
Luster: Vitreous to silky.

Optical Class: Biaxial (-). *Pleochroism:* X = pale yellowish green; Y = blue-green; Z = sky-blue. *Orientation:* Y = b; X \simeq c; Z \simeq a. $\alpha = 1.641\text{--}1.654$ $\beta = 1.690\text{--}1.713$
 $\gamma = 1.705\text{--}1.722$ 2V(meas.) = $56^\circ\text{--}104^\circ$

Cell Data: *Space Group:* Pc [morphological orientation $b > c > a$]. $a = 7.118\text{--}7.137$
 $b = 6.031\text{--}6.034$ $c = 11.209\text{--}11.217$ $\beta = 90.00^\circ\text{--}90.02^\circ$ Z = 2

X-ray Powder Pattern: Lubietová, Slovakia.
7.063 (10), 3.567 (9), 2.134 (9), 2.493 (8), 2.662 (7), 2.616 (7), 1.773 (7)

Chemistry:	(1)	(2)
SO ₃	16.42	16.40
CuO	65.82	65.16
H ₂ O	18.32	18.44
Total	100.56	100.00

(1) Cornwall, England. (2) $\text{Cu}_4(\text{SO}_4)(\text{OH})_6 \cdot 2\text{H}_2\text{O}$.

Polymorphism & Series: Dimorphous with wroewolfeite.

Occurrence: An uncommon but widespread secondary mineral in the oxidation zone of copper sulfide deposits; may be of post-mine formation.

Association: Wroewolfeite, posnjakite, serpierite, devilline, chalcophyllite, connellite, brochantite, malachite, gypsum.

Distribution: Some localities for rich or well-crystallized examples include: in England, in Cornwall, from a number of mines, as the Fowey Consols mine, Tywardreath; Botallack mine, St. Just; large crystals at the Bedford United mine, Tavistock, Devon; in the Engine Vein mine, Alderley Edge, Cheshire; at several mines in Caldbeck Fells, Cumbria. Found in the Dooneen mine, Allihies, Co. Cork, Ireland. In France, at Mazega, Aveyron; in the Roua copper mines, about 50 km north of Nice, Alpes Maritimes, and elsewhere. At L'ubietová, near Baňská Bystrica (Libethen, near Neusohl), Slovakia. In Germany, from the Clara mine, near Oberwolfach, Black Forest; Richelsdorfer Mountains, Hesse; in Saxony, at Schneeberg, Schwartzberg, Freiberg; and others. At Klausen, Alto Adige, Italy. From Tsumeb, Namibia. At the Paddy's River mine, Australian Capital Territory, Australia. In the USA, from the Silver King mine, near Ely, White Pine Co., Nevada; at the Grandview mine, Grand Canyon, Coconino Co., and from Bisbee, Cochise Co., Arizona. In the El Teniente mine, 67 km west of Rancagua, O'Higgins Province, Chile. Many older localities require modern confirmation.

Name: Honoring Victor von Lang (1838–1921), physicist and crystallographer, Professor of Physics, University of Vienna, Vienna, Austria.

Type Material: Natural History Museum, Vienna, Austria, A.a.4353.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 583–585. (2) Galey, J., J. Jaud, R. Pulou, and R. Sempère (1984) Structure cristalline de la langite, $\text{Cu}_4[(\text{SO}_4)(\text{OH})_6\text{H}_2\text{O}]\cdot\text{H}_2\text{O}$. Bull. Minéral., 107, 641–648 (in French with English abs.). (3) Gentsch, M. and K. Weber (1984) Structure of langite, $\text{Cu}_4[(\text{OH})_6|\text{SO}_4]\cdot 2\text{H}_2\text{O}$. Acta Cryst., C40, 1309–1311. (4) Řídkošíl, T. and P. Povondra (1982) The relation between posnjakite and langite. Neues Jahrb. Mineral., Monatsh., 16–28.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise without the prior written permission of Mineral Data Publishing.