

Alumino-oxy-rossmanite

Crystal Data: Hexagonal. *Point Group:* 3*m*. As prismatic crystals.

Physical Properties: *Cleavage:* None. *Tenacity:* Brittle. *Fracture:* Conchoidal. Hardness = 7
D(meas.) = 3.07(3) D(calc.) = 3.092(1) Nonfluorescent.

Optical Properties: Transparent. *Color:* Pink. *Streak:* White. *Luster:* Vitreous.
Optical Class: Uniaxial (-). $\omega = 1.648(5)$ $\varepsilon = 1.628(5)$ *Pleochroism:* *O* = pink, *E* = near colorless.
Orientation: *E* || *c*.

Cell Data: *Space Group:* R3*m*. *a* = 15.803(1) *c* = 7.088(1)

X-Ray Diffraction Pattern: Calculated pattern.
2.5534 (100), 3.9508 (85), 2.9236 (78), 4.1783 (61), 2.4307 (55), 2.0198 (39), 1.8995 (30)

Chemistry:	(1)		(1)
SiO ₂	33.96	Mn ₂ O ₃	1.70
TiO ₂	0.10	CaO	0.04
Al ₂ O ₃	47.08	Li ₂ O	0.25
B ₂ O ₃	11.77	ZnO	0.03
FeO	0.08	Na ₂ O	1.51
Fe ₂ O ₃	0.23	H ₂ O	2.79
MnO	0.52	<u>F</u>	<u>0.09</u>
		Total	100.11

(1) Hengl quarry, near Eibenstein an der Thaya, Waidhofen an der Thaya district, Lower Austria, Austria; average electron microprobe analysis supplemented by secondary ion mass spectrometry, optical absorption and IR spectroscopy, and crystal-structure refinement; corresponds to $^X(\square_{0.53}\text{Na}_{0.46}\text{Ca}_{0.01})^Y(\text{Al}_{2.37}\text{Mn}^{3+}_{0.21}\text{Li}_{0.16}\square_{0.14}\text{Mn}^{2+}_{0.07}\text{Fe}^{3+}_{0.03}\text{Fe}^{2+}_{0.01}\text{Ti}^{4+}_{0.01})^Z\text{Al}_6(\text{Si}_{5.37}\text{Al}_{0.41}\text{B}_{0.22}\text{O}_{18})(\text{BO}_3)_3^V[(\text{OH})_{2.77}\text{O}_{0.23}]^W[\text{O}_{0.80}(\text{OH})_{0.15}\text{F}_{0.05}]$.

Mineral Group: Tourmaline supergroup, X-site vacant group.

Occurrence: An early magmatic Al-rich oxy-tourmaline indicative of high-temperature in a relatively dry environment, which is poor in Li and F, in pegmatitic in amphibolite and biotite-rich paragneiss.

Association: Quartz, albite, microcline, apatite, beryl, schorl.

Distribution: From the Hengl quarry, near Eibenstein an der Thaya, Waidhofen an der Thaya district, Lower Austria, Austria.

Name: Prefixes identify dominant composition of the *Y* and *W* sites in a tourmaline related to *rossmanite* which honors George R. Rossman, Professor of Mineralogy, California Institute of Technology, Pasadena, California, USA.

Type Material: National Museum of Natural History, Washington, D.C., USA (NMNH 173824), the Mineralogical Museum, Harvard University, Cambridge, Massachusetts, USA (134790), the A.E. Fersman Mineralogical Museum, RAS, Moscow, Russia (93533), and the California Institute of Technology, Pasadena, USA (GRR2170 polished section).

References: (1) Ertl, A., J.M. Hughes, S. Prowatke, T. Ludwig, C.L. Lengauer, H.-P. Meyer, G. Giester, U. Kolitsch, and A. Prayer (2022) Alumino-oxy-rossmanite from pegmatites in Variscan metamorphic rocks from Eibenstein an der Thaya, Lower Austria, Austria: A new tourmaline that represents the most Al-rich end-member composition. *Amer. Mineral.*, 107, 157-166.
(2) Henry, D.J., M. Novák, F.C. Hawthorne, A. Ertl, B.L. Dutrow, P. Uher, and F. Pezzotta (2011) Nomenclature of the tourmaline-supergroup minerals. *Amer. Mineral.*, 96, 895-913.