

Engelhauptite**KCu₃(V₂O₇)(OH)₂Cl**

Crystal Data: Hexagonal. *Point Group:* 6/m 2/m 2/m. As rough, spindle-shaped crystals elongated along [0001], to 0.12 mm, displaying {10 $\bar{1}$ 0}, {11 $\bar{2}$ 0} and {0001}; in divergent radiating aggregates or as spherulites to 0.2 mm.

Physical Properties: *Cleavage:* None. *Fracture:* Uneven. *Tenacity:* Brittle. Hardness = n.d. D(meas.) = n.d. D(calc.) = 3.86

Optical Properties: Transparent to translucent. *Color:* Yellow-brown to brown with an olive green hue. *Streak:* Yellow. *Luster:* Vitreous. *Optical Class:* Uniaxial (+). $\omega = 1.978(4)$ $\epsilon = 2.021(4)$ *Pleochroism:* Weak, *O* = brownish yellow, *E* = light yellow. *Absorption:* *O* > *E*.

Cell Data: *Space Group:* P6₃/mmc. *a* = 5.922(2) *c* = 14.513(5) *Z* = 2

X-ray Powder Pattern: AufmKopp quarry, Daun, Eifel region, Rheinland-Pfalz, Germany. 2.979 (100), 7.32 (98), 2.759 (19), 2.565 (18), 2.424 (18), 4.224 (17), 1.765 (16)

Chemistry:	(1)	(2)
K ₂ O	9.63	9.18
FeO	0.05	
NiO	0.29	
CuO	46.11	46.51
Al ₂ O ₃	0.24	
V ₂ O ₅	34.92	35.45
SO ₃	0.79	
Cl	5.94	6.91
H ₂ O	3.37	3.51
<u>-O = Cl₂</u>	<u>1.34</u>	<u>1.56</u>
Total	100.00	100.00

(1) AufmKopp quarry, Daun, Eifel region, Rheinland-Pfalz, Germany; average of 10 electron microprobe analyses supplemented by IR spectroscopy, H₂O by difference; corresponding to K_{1.05}(Cu_{2.97}Al_{0.02}Ni_{0.02}) $\Sigma=3.01$ (V_{1.97}S_{0.05}) $\Sigma=2.02$ O_{7.23}(OH)_{1.91}Cl_{0.86}. (2) KCu₃(V₂O₇)(OH)₂Cl.

Occurrence: A late mineral growing in cavities in nepheline basalt.

Association: Volborthite, allophane, malachite, tangeite, chrysocolla.

Distribution: From AufmKopp quarry (Kahlenberg quarry or "Schlackenkegel der Höhe 636 südöstlich Neroth"), Daun, Oberstadtfeld Municipality, Eifel region, Rheinland-Pfalz, Germany.

Name: Honors the German amateur mineralogist and mineral collector Bernd Engelhaupt (b. 1946) for his contributions to the mineralogy of the Eifel region.

Type Material: A.E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, Russia (94124).

References: (1) Pekov, I.V., O.I. Siidra, N.V. Chukanov, V.O. Yapaskurt, S.N. Britvin, S.V. Krivovichev, W. Schüller, and B. Ternes (2015) Engelhauptite, KCu₃(V₂O₇)(OH)₂Cl, a new mineral species from Eifel, Germany. *Mineralogy and Petrology*, 109(6), 705-711. (2) (2016) *Amer. Mineral.*, 101, 1920-1921 (abs. ref. 1).