

Lindackerite**Cu₅(AsO₄)₂(AsO₃OH)₂·9H₂O**

Crystal Data: Triclinic. *Point Group:* $\bar{1}$. Crystals are lathlike, showing {010}, {001}, {101}, to 0.3 mm; in rosettes and crusts.

Physical Properties: *Cleavage:* {010}, perfect. *Fracture:* Conchoidal. Hardness = 2-2.5
D(meas.) = 3.35(2) D(calc.) = 3.312

Optical Properties: Transparent. *Color:* Apple-green; pale green to colorless in transmitted light. *Streak:* Pale green to white. *Luster:* Vitreous.
Optical Class: Biaxial (+). $\alpha = 1.626-1.632$ $\beta = 1.662$ $\gamma = 1.725-1.728$ $2V(\text{meas.}) = 74^\circ$
 $2V(\text{calc.}) = 72^\circ-73^\circ$ *Pleochroism:* Weak; X = Y = colorless; Z = green. *Dispersion:* $r < v$, strong.
Orientation: $Y \wedge a = 21.3^\circ$ on {010} and 34.4° on {001}.

Cell Data: *Space Group:* $P\bar{1}$. $a = 6.415(1)$ $b = 8.048(1)$ $c = 10.332(1)$ $\alpha = 85.41(1)^\circ$ $\beta = 79.50(1)^\circ$
 $\gamma = 84.71(1)^\circ$ $Z = 1$

X-ray Powder Pattern: Jáchymov, Czech Republic.

10.2 (100), 8.02 (70), 3.668 (60), 3.154 (60), 2.665 (50), 4.001(40), 3.064 (40)

Chemistry:	(1)	(2)	(3)
As ₂ O ₅	44.2	44.64	43.71
CoO		3.39	1.24
NiO		0.00	0.50
CuO	39.4	33.04	36.47
H ₂ O	16.4	[18.93]	[18.08]
Total	100.0	[100.00]	[100.00]

(1) Jáchymov, Czech Republic. (2) Do.; by electron microprobe, H₂O by difference, corresponds to (Cu_{4.36}Co_{0.47}) $\Sigma=4.83$ (AsO₄)_{2.03}[(AsO₃)_{2.03}(OH)_{1.55}]·10.2H₂O. (3) Cap Garonne mine, France; by electron microprobe, H₂O by difference; corresponds to (Cu_{4.90}Co_{0.18}Ni_{0.07}) $\Sigma=5.15$ (AsO₄)_{2.02}[(AsO₃)_{2.03}(OH)_{2.21}]·9.61H₂O.

Mineral Group: Lindackerite supergroup, lindackerite group.

Occurrence: In the oxidized zone of some arsenic-rich copper deposits.

Association: Erythrite, pitticite, annabergite, lavendulan (Jáchymov, Czech Republic); olivenite, chalcantite, antlerite, pushcharovskite, covellite, tennantite, quartz (Cap Garonne mine, France).

Distribution: From the Geister and Červená veins, Eliáš mine, Jáchymov (Joachimsthal), Czech Republic. At the Cap Garonne mine, near le Pradet, Var, and in the Salsigne mine, 15 km north of Carcassonne, Aude, France. From the Carmenes copper mine, Villamanin, Léon Province, Spain. Found at the Talmessi mine, 35 km west of Anarak, Iran.

Name: To honor Joseph *Lindacker*, Austrian pharmacist-chemist, who made the first analyses.

Type Material: National School of Mines, Paris, France.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 1007-1008. (2) Sarp, H. and B. Dominik (1995) Redefinition of lindackerite: new chemical formula and new crystallographic and optical data. Archs Sci. Genève, 48(3), 239-250 (in French with English abs.). (3) Hybler, J., P. Ondruš, I. Císařová, V. Petříček, and F. Veselovský (2003) Crystal structure of lindackerite, (Cu,Co,Ni)Cu₄(AsO₄)₂(AsO₃OH)₂·9H₂O from Jáchymov, Czech Republic. Eur. J. Mineral., 15, 1035-1042. (4) (2004) Amer. Mineral., 89, 1833 (abs. ref. 3).