

Takovite**Ni₆Al₂(CO₃, OH)(OH)₁₆•4H₂O**

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Crystal Data: Hexagonal. *Point Group:* [$\bar{3} 2/m$ or 3] (by analogy to the hydrotalcite group). Microcrystalline, platy, to 1 μm ; commonly in veinlets and massive.

Physical Properties: Hardness = [~ 2] D(meas.) = 2.80 D(calc.) = 2.95

Optical Properties: Translucent. *Color:* Bluish green, yellowish green. *Optical Class:* Uniaxial (-). $\omega = 1.602\text{--}1.605$ $\epsilon = 1.594\text{--}1.598$ $2V(\text{meas.}) = \text{Small}$.

Cell Data: *Space Group:* [$R\bar{3}m$ or $R3$] (by analogy to the hydrotalcite group). $a = 3.025\text{--}3.028$ $c = 22.45\text{--}22.595$ $Z = 3/8$

X-ray Powder Pattern: Takovo, Serbia; very close to complainite. 7.566 (10), 3.767 (9), 2.552 (9), 1.917 (9), 2.264 (8), 1.510 (8), 1.481 (8)

Chemistry:	(1)	(2)	(3)	(1)	(2)	(3)
SiO ₂	10.17	6.2		Na ₂ O	0.46	
Al ₂ O ₃	20.16	16.0	12.58	K ₂ O	0.09	
Fe ₂ O ₃	1.78	1.16		H ₂ O ⁺	26.60	
NiO	37.24	41.15	55.31	H ₂ O ⁻	3.48	
ZnO		0.03		H ₂ O		25.38 26.68
MgO		0.45		CO ₂	n.d.	11.14 5.43
CaO	0.47	0.11		Total	100.45	101.62 100.00

(1) Takovo, Serbia; quartz 10.17%, goethite 2%, and calcite 0.8% considered as impurities. (2) Agnew, Australia; after deduction of SiO₂ impurity, corresponds to (Ni_{4.94}Fe_{0.13}Mg_{0.10}Ca_{0.02}Al_{2.81}) $\Sigma=8.00$ (OH)_{14.42}(CO₃)_{2.27}•5.42H₂O. (3) Ni₆Al₂(OH)₁₆CO₃•4H₂O.

Mineral Group: Hydrotalcite group.

Occurrence: In a karstitic bauxite at the contact of limestone and metamorphosed serpentinite (Takovo, Serbia); an alteration product of nickel sulfides (Western Australia).

Association: Gibbsite, allophane (Takovo, Serbia); glaukosphaerite, népouite, gaspéite, paratacamite, nickeloan magnesite, gypsum, (Kambalda, Australia).

Distribution: From Takovo, Serbia. In the Blangvette West mine, Le Thoronet, Var, France. On Mueo, New Caledonia. In Western Australia, at the Carr Boyd Rocks nickel mine; the Agnew nickel deposit, north of Kalgoorlie; from Kambalda, 56 km south of Kalgoorlie; and the Dordie North nickel deposit. In the USA, at Wells Canyon, Oquirrh Mountains, Utah Co., Utah, and at the Alpine mine, Clear Creek, San Benito Co., California.

Name: For Takovo, Serbia, from which it was first described.

Type Material: National Museum of Natural History, Washington, D.C., USA, 136981.

References: (1) Maksimović, Z. (1957) Takovite, a new mineral from Takovo, Serbia. *Compt. Rend. Soc. serbe Géol, ann.* 1955, 219. (2) (1958) *Mineral. Abs.*, 13, 624 (abs. ref. 1). (3) Maksimovic, Z. (1970) Features and genesis of takovite. *Zap. Vses. Mineral. Obshch.*, 99, 595–600 (in Russian). (4) (1972) *Amer. Mineral.*, 57, 1559 (abs. refs. 1 and 3). (5) Nickel, E.H., C.E.S. Davis, M. Bussell, P.J. Bridge, J.G. Dunn, and R.D. MacDonald (1977) Eardleyite [takovite] as a product of the supergene alteration of nickel sulfides in Western Australia. *Amer. Mineral.*, 62, 449–457. (6) Bish, D.L. and G.W. Brindley (1977) A reinvestigation of takovite, a nickel aluminum hydroxy-carbonate of the pyroaurite group. *Amer. Mineral.*, 62, 458–464. (7) Taylor, H.W.F. (1973) Crystal structures of some double hydroxide minerals. *Mineral. Mag.*, 39, 377–389.

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