

Erni nickelite

NiMn₃⁴⁺O₇•3H₂O

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Crystal Data: Hexagonal. *Point Group:* $\bar{3}$ or 3. Platy crystals, hexagonal to nearly circular, to 0.5 mm; in rosettes of randomly-oriented plates, and radial aggregates. *Twinning:* On $\{\bar{1}2\bar{1}0\}$.

Physical Properties: *Cleavage:* {0001}, perfect. *Fracture:* Splintery. *Tenacity:* Brittle. Hardness = 2 D(meas.) = 3.84(4) D(calc.) = 3.83

Optical Properties: Opaque, translucent in the thinnest plates. *Color:* Red-brown, nearly black. *Streak:* Yellow-brown. *Luster:* Metallic, submetallic to vitreous. *Optical Class:* Uniaxial (-). $\omega = > 2.00$ $\epsilon = 1.97(2)$ *Anisotropism:* White with light blue tint; gray. *Birefractance:* Strong. R₁-R₂: n.d.

Cell Data: *Space Group:* $R\bar{3}$ or $R3$. $a = 7.514(2)$ $c = 20.52(2)$ $Z = 6$

X-ray Powder Pattern: Near Siberia, Western Australia. 6.84 (10), 2.219 (3), 4.01 (2), 1.884 (2), 1.575 (2), 3.44 (1), 2.748 (1)

Chemistry:	(1)	(2)	(3)	(1)	(2)	(3)
MnO ₂		65.15	66.96	CuO	1.99	
CeO ₂		0.58		MgO	0.30	
Co ₂ O ₃		0.90		BaO	2.29	
MnO	68.25			K ₂ O	0.38	
CoO	0.30			H ₂ O	[13.94]	[18.45]
NiO	16.68	10.26	19.17	Total	[99.47]	[100.00]
						100.00

(1) Near Siberia, Western Australia; by electron microprobe, average of two analyses; H₂O calculated from stoichiometry; corresponds to (Ni_{0.87}Mn_{0.04}Mg_{0.03}Co_{0.02})_{Σ=0.96}Mn₃O₇•3H₂O. (2) Kamenny Kobchik deposit, Russia; by electron microprobe, average of two analyses, H₂O by difference; after correction for cerianite and hollandite as impurities, corresponds to (Ni_{0.74}Cu_{0.14}Co_{0.06})_{Σ=0.94}Mn_{3.06}O_{7.09}•5.55H₂O. (3) NiMn₃⁴⁺O₇•3H₂O.

Occurrence: In an intensely laterized ultramafic intrusion (Siberia, Western Australia); in the weathering zone of ultramafic rocks (Kamenny Kobchik deposit, Russia).

Association: Chalcedonic quartz, magnesite, serpentine, nimite, nontronite, goethite, nickel-rich clay minerals (Siberia, Western Australia); asbolane, lithiophorite, hollandite, cerianite (Kamenny Kobchik deposit, Russia).

Distribution: In the SM7 open pit, near Siberia, 60 km north of Kalgoorlie, Western Australia. From the Kamenny Kobchik deposit, Kempirsay massif, Southern Ural Mountains, Russia.

Name: In honor of Dr. Ernest Henry Nickel (1925–), Canadian-Australian mineralogist with the C.S.I.R.O., Perth, Australia.

Type Material: Canadian Museum of Nature, Ottawa, Canada, 81510.

References: (1) Grice, J.D., B. Gartrell, R.A. Gault, and J. Van Velthuisen (1994) Erni nickelite, NiMn₃O₇•3H₂O, a new mineral species from the Siberia complex, Western Australia: comments on the crystallography of the chalcophanite group. *Can. Mineral.*, 32, 333–337. (2) (1995) *Amer. Mineral.*, 80, 404 (abs. ref. 1). (3) Gorshkov, A.I., G.R. Kapustkin, A.V. Sivtsov, I.M. Lazarenko, and L.S. Subrovinskiy (1992) Ni-chalcophanite: a new variety of the mineral from a weathering crust on ultramafic rocks of the Kempirsay massif (southern Urals). *Izvest. Akad. Nauk, Ser. Geol.*, 1992(11), 108–117 (in Russian). (4) (1994) *Amer. Mineral.*, 79, 388–389 (abs. ref. 3).

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