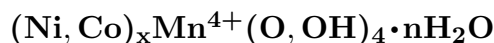


Asbolane



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Crystal Data: Hexagonal. *Point Group:* n.d. Platelets, to several μm , in thin lamellar aggregates; massive.

Physical Properties: Hardness = n.d. $D(\text{meas.}) = \text{n.d.}$ $D(\text{calc.}) = \text{n.d.}$

Optical Properties: [Opaque.] *Color:* Brownish black.

Optical Class: Uniaxial.

R_1 – R_2 : n.d.

Cell Data: *Space Group:* n.d. $a = 2.832$ $c = 9.34$, or $a = 3.04$ $c = 9.34$ $Z = \text{n.d.}$

X-ray Powder Pattern: Lipov deposit, Russia.

4.82 (s), 2.445 (mw), 9.6 (w), 1.7 (vw), 1.419 (vw)

Chemistry:

	(1)
SiO_2	0.6
Al_2O_3	0.1
Fe_2O_3	0.9
Co_2O_3	1.0
MnO	66.7
NiO	17.9
H_2O	[12.8]
Total	[100.0]

(1) New Caledonia; by electron microprobe, total Fe as Fe_2O_3 , H_2O by difference. (2) Lipov deposit, Russia; TEM energy-dispersive analysis, supported by TGA and IR, not given, is stated to correspond to $(\text{Ni}_{0.28}\text{Co}_{0.12}\text{Ca}_{0.05})_{\Sigma=0.45}\text{MnO}_{1.5}(\text{OH})_2 \cdot 0.64\text{H}_2\text{O}$.

Occurrence: As a weathering product in silicic rocks (Russia); in siliceous schists (Kara-Chagyra, Uzbekistan); widespread in residual soils above ultramafic rocks (New Caledonia).

Association: Goethite.

Distribution: From Kamsdorf, Thuringia, Germany. In the Lipov and Tyulenev deposits, Middle Ural Mountains, and the Buranov deposit, Southern Ural Mountains, Russia. At Kara-Chagyra, Uzbekistan. In the San Luis mine, Chulchucani, Potosi, Bolivia. Found at a number of places in New Caledonia. Probably from additional localities, but careful characterization is required.

Name: From the Greek for *to soil like soot*.

Type Material: n.d.

References: (1) Palache, C., H. Berman, and C. Frondel (1944) Dana's system of mineralogy, (7th edition), v. I, 566, 568 [asbolite, asbolan]. (2) Chukhrov, F.V., A.I. Gorshkov, I.V. Vitovskaya, V.A. Drits, A.V. Sivtsov, and Y.S. Rudnitskaya (1980) Crystallochemical nature of Co-Ni-asbolan. *Izv. Akad. Nauk SSSR, Ser. Geol.*, no. 6, 73–81 (in Russian). (3) Chukhrov, F.V., A.I. Gorshkov, I.V. Vitovskaya, V.A. Drits, A.V. Sivtsov, and Y.P. Dikov (1980) Crystallochemical nature of Ni-asbolan. *Izv. Akad. Nauk SSSR, Ser. Geol.*, no. 9, 108–120 (in Russian). (4) (1981) *Mineral. Abs.*, 32, 322 (abs. ref. 2). (5) (1982) *Amer. Mineral.*, 67, 417–418 (abs. refs. 2 and 3). (6) Llorca, S. and P. Monchoux (1991) Supergene cobalt minerals from New Caledonia. *Can. Mineral.*, 29, 149–161. (7) Manceau, A., A.I. Gorshkov, and V.A. Drits (1992) Structural chemistry of Mn, Fe, Co, and Ni in manganese hydrous oxides: part II. Information from EXAFS spectroscopy and electron and X-ray diffraction. *Amer. Mineral.*, 77, 1144–1157.

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