

**Crystal Data:** Tetragonal. *Point Group:*  $4/m$ . As minute irregular grains, and rarely as prismatic crystals up to 0.07 mm.

**Physical Properties:** Hardness = n.d. VHN = 715–864, 806 average (100 g load).  
D(meas.) = n.d. D(calc.) = 6.705

**Optical Properties:** Opaque. *Color:* Silvery; in reflected light, creamy white.  
*Luster:* Metallic, strong. *Anisotropism:* Weak to moderate, dark brown to dark blue-gray.

$R_1$ – $R_2$ : (400) 41.2–42.0, (420) 42.2–43.0, (440) 43.0–43.9, (460) 43.7–44.5, (480) 44.2–45.0, (500) 44.5–45.4, (520) 44.9–45.6, (540) 45.1–45.8, (560) 45.4–46.1, (580) 45.6–46.3, (600) 45.8–46.5, (620) 46.0–46.6, (640) 46.0–46.6, (660) 46.0–46.5, (680) 45.7–46.3, (700) 45.4–46.2

**Cell Data:** *Space Group:*  $P4_2/m$ .  $a = 6.368(3)$   $c = 6.562(3)$   $Z = 8$

**X-ray Powder Pattern:** Lac des Iles complex, Canada. Easily confused with braggite.  
2.846 (100), 2.914 (90), 2.612 (80), 2.650 (70), 1.857 (70), 1.142 (70), 2.150 (60)

<b>Chemistry:</b>	(1)	(2)	(3)
Pd	57.6	67.6	60.8
Pt	4.4	2.2	13.5
Ni	16.6	5.9	4.1
S	21.4	24.1	22.1
Total	100.0	99.8	100.5

(1) Noril'sk region, Russia; by electron microprobe. (2–3) Stillwater complex, Montana, USA; by electron microprobe.

**Polymorphism & Series:** Forms a series with braggite.

**Occurrence:** In andesine diabases (Noril'sk region, Russia) and in ultramafic layered intrusives elsewhere. As disseminations that probably are crystallized products, at magmatic temperatures, of a residual immiscible sulfide melt.

**Association:** Chalcopyrite, millerite, nickelian pyrite, linnaeite, cooperite (Noril'sk region, Russia); pentlandite, pyrrhotite, chalcopyrite, cubanite, nickelian mackinawite, gold, braggite, cooperite, moncheite, isoferroplatinum, kotulskite, keithconnite, palladian tulameenite (Stillwater complex, Montana, USA); hongshiite, cooperite, sperrylite, isomertieite, magnetite, bornite, polydymite, diopside, actinolite, epidote (Yen deposit, China).

**Distribution:** One of most common and economically important platinum group minerals. From the Noril'sk region, western Siberia, Russia. In the Upper and Banded portions of the Stillwater complex, Montana; from near Moapa, Clark Co., Nevada; and from the Yuba River, Nevada Co., California, USA. At the Lac des Iles complex, Ontario, Canada. In the Yen deposit (a code name), China. From the Konttijärvi and Siikakämä intrusions, and in the Kirakkajuppura deposit, Penikat layered complex, northeast of Kemi, Finland.

**Name:** For Nikolai Konstaninovich Vysotskii (1864–1932), Soviet geologist, who first found platinum at Noril'sk, Russia.

**Type Material:** Mining Institute, St. Petersburg, 93a/1; A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 64853.

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