Stillwaterite Pd_8As_3

Crystal Data: Hexagonal. *Point Group:* $\overline{3}$ or 3. As anhedral grains, to 265 μm. *Twinning:* Rarely observed in polished section.

Physical Properties: Hardness = n.d. VHN = 384 (50 g load). D(meas.) = n.d. D(calc.) = 10.96

Optical Properties: Opaque. *Color:* In polished section, pale creamy gray with faint pinkish tint.. *Luster:* Metallic. *Anisotropism:* Weak in air, dark gray to brownish gray; in oil, distinct in brownish black with a blue to yellow-brown tinge.

R_1–R_2: (470) 51.6–52.7, (546) 52.5–53.2, (589) 53.1–53.7, (650) 54.4–55.0

Cell Data: *Space Group:* $P\overline{3}$ or $P3$. $a = 7.392$–7.399 $c = 10.311$ Z = 3

X-ray Powder Pattern: Stillwater complex, Montana, USA.
2.115 (100), 2.355 (80), 1.351 (50), 0.8858 (40), 2.700 (30), 1.991 (30b), 2.521 (20)

Chemistry:

	(1)	(2)	(3)
Pd	79.0	79.13	79.11
Pt		0.40	
Au		0.07	
Ni		0.01	
As	21.2	20.83	20.89
Sb		0.05	
Bi		0.04	
S		0.03	
Total	100.2	[100.56]	100.00

(1) Stillwater complex, Montana, USA; by electron microprobe; corresponds to $Pd_{7.87}As_{3.00}$. (2) Siikakämä intrusion, Finland; by electron microprobe, average of three grains, original total given as 100.58%; corresponds to $(Pd_{7.97}Pt_{0.02})_{\Sigma=7.99}(As_{2.98}S_{0.01})_{\Sigma=2.99}$. (3) Pd_8As_3.

Occurrence: In layered ultramafic igneous bodies.

Association: Gold, palladoarsenide, sperrylite, braggite, hollingworthite, chalcopyrite, digenite, pentlandite, pyrrhotite.

Distribution: From the Banded and Upper zones of the Stillwater complex, Montana, USA [TL]. In the Roby zone, Lac des Iles complex, Ontario, Canada. At the Siikakämä intrusion, about 50 km southeast of Rovaniemi, northern Finland. From the Lukkulaisvaara layered intrusion, Karelia, Russia.

Name: For the Stillwater mafic complex, Montana, USA.

Type Material: Royal Ontario Museum, Toronto, Canada, M33559; The Natural History Museum, London, England, 1979,129; National Museum of Natural History, Washington, D.C., USA, 132500.

References: (1) Cabri, L.J., J.L.G. Laflamme, J.M. Stewart, J.F. Rowland, and Tzong R. Chen (1975) New data on some palladium arsenides and antimonides. Can. Mineral., 13, 321–335. (2) (1977) Amer. Mineral., 62, 1060 (abs. ref. 1). (3) Hänninen, E., R. Törnroos, and S.I. Lahti (1986) Stillwaterite and associated platinum group minerals from the Siikakämä layered mafic intrusion, northern Finland. Lithos, 19, 87–93.