Padmaite PdBiSe

Crystal Data: Cubic. *Point Group*: 432. As isometric, irregular grains to 0.2 mm, and as symplectic intergrowths with palladium sulfides to 0.02 mm.

Physical Properties: *Cleavage*: Imperfect along two perpendicular directions. *Tenacity*: n.d. *Fracture*: n.d. VHN = 260-272 (20 g load). Hardness = 3-4 D(meas.) = n.d. D(calc.) = 9.86

Optical Properties: Opaque. *Color*: Light yellow; pinkish yellow in reflected light, no internal reflections. *Streak*: n.d. *Luster*: Metallic.
Optical Class: Isotropic.
R: (400) 46.5, (420) 45.4, (440) 44.9, (460) 46.6, (470) 47.5, (480) 48.0, (500) 48.0, (520) 49.0, (540) 48.6, (546) 48.3, (560) 47.7, (580) 46.8, (589) 46.8, (600) 46.0, (620) 45.4, (640) 45.3, (650) 45.6, (660) 45.6, (680) 48.7, (700) 51.4

Cell Data: *Space Group*: $P4_132$ or $P4_332$ (by analogy to synthetic PdBiSe) a = 6.448(3) Z = 4

X-ray Powder Pattern: Near the Padma River, southern Karelia, Russia.
2.89 (100), 2.63 (90), 1.943 (90), 1.724 (50), 1.376 (40), 2.283 (30), 1.790 (30)

Chemistry:

	(1)	(2)
Pd	25.70	27.11
Pt	1.20	0.00
Bi	53.60	52.71
Ag	0.80	0.00
Au	0.00	0.16
Se	18.80	20.73
S	0.20	0.11
Total	100.30	100.87

(1) Near the Padma River, southern Karelia, Russia; electron microprobe analysis; corresponds to $Pd_{0.96}Pt_{0.02}Bi_{1.02}Ag_{0.03}Se_{0.94}S_{0.02}$. (2) Buraco do Ouro mine, Cavalcante, Goiás State, Central Brazil; electron microprobe analysis, total includes Cu 0.04 and Fe 0.01.

Occurrence: In metasomatic rocks in shungite-bearing metashales (Russia); in hydrothermally altered (sericitization, silicification, with minor K-metasomatism) granite-related mylonite (Brazil). An uncommon component in placer deposits.

Association: Clausthalite, paraguanajuatite, bohdanowiczite, sobolevskite, froodite, hematite, native Bi and Au, roscoelite, chromium phengite, dolomite, quartz (Russia); clausthalite, kalungaite, sperrylite, uraninite, paraguanajuatite (Brazil).

Distribution: From near the Padma River, southern Karelia, Russia [TL]. At the Buraco do Ouro gold mine, Cavalcante, Goiás State, Central Brazil. In the Jinchuan intrusion, northern China.

Name: For the Russian river near where the first specimens were collected.

Type Material: The Mining Museum of the Leningrad Mining Institute, Russia.

References: (1) Polekhovskij, Yu.S., A.V. Voloshin, L.P. Tarasova, S.A. Nikitin, Ya.A. Pakhomovskij, Yu.P. Menshikov, Yu.L. Kretzer, and T.L Kolytscheva (1991) Padmaite PdBiSe -A new selenide of palladium and bismuth from metasomatites of the southern Karelia. Zapiski Vsese Mineral. Obshch., 120(3), 85-88 (in Russian). (2) (1993) Amer. Mineral., 78, 451-452 (abs. ref. 1). (3) Menez, J. and N.F. Botelho (2017) Ore characterization and textural relationships among gold, selenides, platinum-group minerals and uraninite at the granite-related Buraco do Ouro gold mine, Cavalcante, Central Brazil. Mineral. Mag., 81(3), 463-475. (4) Prichard, H.M., R.D. Knight, P.C. Fisher, I. McDonald , M.-F. Zhou, and C.Y. Wang (2013) Distribution of platinum-group elements in magmatic and altered ores in the Jinchuan intrusion, China: an example of selenium remobilization by postmagmatic fluids. Mineral. Deposita, 48,767-786.