Insizwaite $Pt(Bi,Sb)_2$

Crystal Data: Cubic. *Point Group:* $2/m\ \overline{3}$. As small rounded grains, to 120 μm.

Physical Properties: Hardness = n.d. VHN = 488–540, 519 average (25 g load). D(meas.) = n.d. D(calc.) = 12.8

Optical Properties: Opaque. *Color:* In polished section, white. *Luster:* Metallic.
R: (400) 55.7, (420) 56.4, (440) 57.2, (460) 57.8, (480) 58.4, (500) 58.8, (520) 59.2, (540) 59.5, (560) 59.8, (580) 60.1, (600) 60.3, (620) 60.4, (640) 60.4, (660) 60.3, (680) 60.3, (700) 60.3

Cell Data: *Space Group:* $Pa3$. $a = 6.691$ $Z = 4$

X-ray Powder Pattern: Synthetic $PtBi_2$.
2.996 (100), 2.017 (90), 2.732 (80), 1.788 (60), 3.343 (50), 1.459 (50), 0.772 (50)

Chemistry:

	(1)	(2)
Pt	36.1	31.2
Pd		1.4
Ni		0.17
Sn		1.3
Bi	52.0	55.2
Sb	12.9	2.4
Te		7.7
Total	101.0	100.5

(1) Insizwa deposit, South Africa; by electron microprobe, average of five analyses; corresponding to $Pt_{1.00}(Bi_{1.35}Sb_{0.57})_{\Sigma=1.92}$. (2) Sudbury, Canada; by electron microprobe; corresponding to $(Pt_{0.90}Pd_{0.08}Ni_{0.02})_{\Sigma=1.00}(Bi_{1.49}Te_{0.34}Sb_{0.11}Sn_{0.06})_{\Sigma=2.00}$.

Mineral Group: Pyrite group.

Occurrence: Of hydrothermal origin, in a vein cutting massive pyrrhotite ore (Insizwa deposit, South Africa); in Cu–Ni sulfide ore (Sudbury, Canada).

Association: Pentlandite, cubanite, hessite, altaite, argentopentlandite, chalcopyrite, mackinawite, niggliite, froodite, parkerite, galena, sphalerite, magnetite, pyrrhotite.

Distribution: From the Insizwa Cu–Ni deposit, Waterfall Gorge, East Cape, South Africa [TL]. In the Coleman mine, Sudbury, and the Strathcona mine, Falconbridge, Ontario, Canada. At Fox Gulch, Goodnews Bay, Alaska, USA. From the Noril'sk region, western Siberia, Russia.

Name: For the Insizwa deposit, South Africa, where it was discovered.

Type Material: Geological Survey of Canada, Ottawa, 10400; Canadian Museum of Nature, Ottawa, Canada.

References: (1) Cabri, L.J. and D.C. Harris (1972) The new mineral insizwaite ($PtBi_2$) and new data on niggliite (PtSn). Mineral. Mag., 38, 794–800. (2) (1973) Amer. Mineral., 58, 805 (abs. ref. 1). (3) Brese, N.A. and H.G von Schnering (1994) Bonding trends in pyrites and a reinvestigation of the structures of $PdAs_2$, $PdSb_2$, $PtSb_2$ and $PtBi_2$. Z. Anorg. Allg. Chem., 620, 393–404. (4) Cabri, L.J., Ed. (1981) Platinum group elements: mineralogy, geology, recovery. Can. Inst. Min. & Met., 109–110, 162. (5) Criddle, A.J. and C.J. Stanley, Eds. (1993) Quantitative data file for ore minerals, 3rd ed. Chapman & Hall, London, 251.