Platarsite $(Pt, Rh, Ru)AsS$

Crystal Data: Cubic. *Point Group:* $2/m\ \overline{3}$. As subhedral grains, the largest being a triangular crystal, to 1.1 mm; may be inclusions in platinum nuggets, chromite, and silicate minerals.

Physical Properties: Hardness = n.d. VHN = 902–1033; 1379–1584, 1486 average (50 g load). D(meas.) = 8.0 D(calc.) = 8.375

Optical Properties: Opaque. *Color:* In polished section, gray. *Luster:* Metallic.
R: (400) — , (420) 47.7, (440) 47.4, (460) 47.3, (480) 47.3, (500) 47.1, (520) 47.5, (540) 48.0, (560) 48.2, (580) 48.7, (600) 49.0, (620) 49.9, (640) 48.9, (660) 49.5, (680) 49.8, (700) 49.6

Cell Data: *Space Group: Pa*3. $a = 5.790(1)$ $Z = 4$

X-ray Powder Pattern: Onverwacht mine, South Africa; all reflections broad.
1.746 (100), 2.896 (90), 3.345 (80), 1.114 (70), 2.047 (60), 2.590 (50), 2.364 (50)

Chemistry:

	(1)	(2)	(3)
Pt	26.9	30.4	22.4
Rh	12.8	10.8	8.0
Ru	11.4	9.1	6.4
Ir	3.6	5.9	17.5
Os	0.58	0.10	2.7
As	31.7	33.2	31.2
S	13.0	10.7	10.7
Total	99.98	100.2	98.9

(1) Onverwacht mine, South Africa; by electron microprobe, corresponding to $(Pt_{0.34}Rh_{0.30}Ru_{0.28}Ir_{0.05})_{\Sigma=0.97}As_{1.04}S_{0.99}$. (2) Do.; by electron microprobe, corresponding to $(Pt_{0.40}Rh_{0.27}Ru_{0.23}Ir_{0.08})_{\Sigma=0.98}As_{1.15}S_{0.86}$. (3) Western Platinum mine, South Africa; by electron microprobe, corresponding to $(Pt_{0.31}Ir_{0.25}Rh_{0.21}Ru_{0.17}Os_{0.04})_{\Sigma=0.98}As_{1.12}S_{0.90}$.

Mineral Group: Cobaltite group.

Occurrence: In dunite pipes and replacement pegmatite deposits; in layered mafic intrusions and ophiolites; in placers.

Association: Stibiopalladinite, ruthenarsenite, mertieite-II, genkinite, Pt–Fe–Cu–Ni alloys, bornite, chromite.

Distribution: From the Onverwacht [TL], Driekop, Union, and Western Platinum mines, in the Merensky Reef, Bushveld complex, Transvaal, South Africa. At Fox Gulch, Goodnews Bay, Alaska, USA. From Chromwerk, Kraubath ultramafic massif, Styria, Austria. At the Braganca massif, northern Portugal. In Russia, in placers on the Pustaya River, Kamchatka, and Neozhidannyy Creek, Tuva; and in the Imandra complex, Kola Peninsula. From the Munni Munni layered intrusion, Pilbara Block, Western Australia.

Name: For the composition.

Type Material: Royal Ontario Museum, Toronto; Canadian Museum of Nature, Ottawa, Canada; National Museum of Natural History, Washington, D.C., USA, 136485; A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia.

References: (1) Cabri, L.J., J.H.G. Laflamme, and J.M. Stewart (1977) Platinum-group minerals from Onverwacht. II. Platarsite, a new sulfarsenide of platinum. Can. Mineral., 15, 385–388. (2) Szymański, J.T. (1979) The crystal structure of platarsite, $Pt(As,S)_2$, and a comparison with sperrylite, $PtAs_2$. Can. Mineral., 17, 117–123. (3) Cabri, L.J., Ed. (1981) Platinum group elements: mineralogy, geology, recovery. Can. Inst. Min. & Met., 128–129. (4) Criddle, A.J. and C.J. Stanley, Eds. (1993) Quantitative data file for ore minerals, 3rd ed. Chapman & Hall, London, 439.