Iridarsenite $(Ir, Ru)As_2$

Crystal Data: Monoclinic. *Point Group:* $2/m$. As irregular inclusions, to 60 μm, in a matrix of rutheniridosmine.

Physical Properties: Hardness = n.d. VHN = 488 and 686 (100 g load) on two grains. D(meas.) = n.d. D(calc.) = 10.9

Optical Properties: Opaque. *Color:* In polished section, medium gray with brownish tint. *Luster:* Metallic. *Pleochroism:* Weak to none. *Anisotropism:* Weak but distinct, from medium gray to pale orange-brown.
R_1–R_2: (470) 47.2–46.9, (546) 45.4–46.1, (589) 44.9–46.6, (650) 41.4–44.0

Cell Data: *Space Group:* $P2_1/c$ (synthetic). $a = 6.05$ $b = 6.06$ $c = 6.18$ $\beta = 113°17'$ $Z = 4$

X-ray Powder Pattern: Papua New Guinea.
3.90 (100), 2.840 (70), 2.069 (60), 2.610 (50), 1.910 (50), 1.943 (40), 1.875 (40)

Chemistry:

	(1)	(2)
Ir	40.7	52.2
Ru	10.3	1.7
Os	1.3	0.4
Pt	0.5	1.1
Rh	0.9	0.2
Pd		0.1
As	46.2	44.0
S		0.2
Total	99.0	99.9

(1) Papua New Guinea; by electron microprobe, corresponds to $(Ir_{0.69}Ru_{0.33}Os_{0.02})_{\Sigma=1.04}As_{2.00}$.
(2) Do.; by electron microprobe, average of four other grains; corresponds to $(Ir_{0.92}Ru_{0.06}Os_{0.01}Pt_{0.02}Rh_{0.01})_{\Sigma=1.02}(As_{1.97}S_{0.03})_{\Sigma=2.00}$.

Occurrence: In nuggets or fragments of natural Os–Ir–Ru alloys.

Association: Irarsite, ruthenarsenite, rutheniridosmine.

Distribution: From an unspecified locality [probably the Waria River, Bowutu Mountains, or the Yodda Goldfield] in Papua New Guinea [TL]. In the Merensky Reef, Bushveld complex, Witwatersrand, Transvaal, South Africa. From near Zlatoust, Ural Mountains, Russia. In placers at Anduo, Tibet, China. From Fox Gulch, Goodnews Bay, Alaska, USA.

Name: For the IRIDium and ARSENic in the composition.

Type Material: Geological Survey of Canada, 12160; Canadian Museum of Nature, Ottawa, Canada.

References: (1) Harris, D.C. (1974) Ruthenarsenite and iridarsenite, two new minerals from the Territory of Papua and New Guinea and associated irarsite, laurite, and cubic iron-bearing platinum. Can. Mineral., 12, 280–284. (2) (1976) Amer. Mineral., 61, 177 (abs. ref. 1). (3) Harris, D.C. and L.J. Cabri (1973) The nomenclature of the natural alloys of osmium, iridium and ruthenium based on new compositional data of alloys from world-wide occurrences. Can. Mineral., 12, 104–112. (4) Quensel, J.C. and R.D. Heyding (1962) Transition metal arsenides V. A note on the rhodium/arsenic system and the monoclinic diarsenides of the cobalt family. Canadian J. Chem., 40, 814–818.