Ruthenarsenite (Ru, Ni)As

Crystal Data: Orthorhombic. *Point Group:* $2/m\ 2/m\ 2/m$. As irregular inclusions, to 100 μm, in a matrix of rutheniridosmine.

Physical Properties: Hardness = n.d. VHN = 743–933 (100 g load). D(meas.) = n.d. D(calc.) = 10.0 for $Ru_{0.89}Ni_{0.11}As$.

Optical Properties: Opaque. *Color:* In polished section, pale orange-brown to brownish gray. *Pleochroism:* Distinct. *Anisotropism:* Strong, orange-brown to pale steel-gray.
R_1–R_2: (470) 46.1–48.8, (546) 47.5–49.5, (589) 49.3–50.9, (650) 51.1–52.4

Cell Data: *Space Group: Pnma* (synthetic RuAs). $a = 5.628$ $b = 3.239$ $c = 6.184$
$Z = 4$

X-ray Powder Pattern: Papua New Guinea.
2.061 (100), 2.696 (70), 2.124 (50), 1.780 (40), 1.750 (40), 1.343 (40), 1.302 (40)

Chemistry:

	(1)	(2)
Ru	44.6	29.1
Ir	4.0	
Os	2.1	
Pt		1.5
Rh	2.3	27.4
Pd	1.8	0.59
Ni	4.4	0.69
As	39.4	41.1
Sb		1.4
Total	98.6	101.78

(1) Papua New Guinea; by electron microprobe, corresponding to $(Ru_{0.79}Ni_{0.13}Ir_{0.04}Rh_{0.04}Pd_{0.03}Os_{0.02})_{\Sigma=1.05}As_{0.95}$. (2) Onverwacht mine, South Africa; by electron microprobe, corresponding to $(Ru_{0.51}Rh_{0.47}Ni_{0.02}Pt_{0.01}Pd_{0.01})_{\Sigma=1.02}(As_{0.96}Sb_{0.02})_{\Sigma=0.98}$.

Occurrence: As inclusions in Os–Ir–Ru alloys (Papua New Guinea), and in Alpine-type ultramafics.

Association: Rutheniridosmine, irarsite, iridarsenite.

Distribution: From an unspecified locality [probably the Waria River, Bowutu Mountains, or the Yodda Goldfield] in Papua New Guinea [TL]. At Anduo, Tibet, China. In the Onverwacht mine, on the Merensky Reef, Bushveld complex, Transvaal, South Africa.

Name: For RUTHENium and ARSENic in the composition.

Type Material: 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) Cabri, L.J., Ed. (1981) Platinum group elements: mineralogy, geology, recovery. Can. Inst. Min. & Met., 134, 154.