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 Ru0.89Ni0.11As.

Optical Properties:  
Opaque.  
Color: In polished section, pale orange-brown to brownish gray.  
Pleochroism: Distinct.  
Anisotropism: Strong, orange-brown to pale steel-gray.  
R1–R2: (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:  

<table>
<thead>
<tr>
<th>Element</th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ru</td>
<td>44.6</td>
<td>29.1</td>
</tr>
<tr>
<td>Ir</td>
<td>4.0</td>
<td></td>
</tr>
<tr>
<td>Os</td>
<td>2.1</td>
<td></td>
</tr>
<tr>
<td>Pt</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>Rh</td>
<td>2.3</td>
<td>27.4</td>
</tr>
<tr>
<td>Pd</td>
<td>1.8</td>
<td>0.59</td>
</tr>
<tr>
<td>Ni</td>
<td>4.4</td>
<td>0.69</td>
</tr>
<tr>
<td>As</td>
<td>39.4</td>
<td>41.1</td>
</tr>
<tr>
<td>Sb</td>
<td>1.4</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>98.6</td>
<td>101.78</td>
</tr>
</tbody>
</table>

(1) Papua New Guinea; by electron microprobe, corresponding to (Ru0.79Ni0.15Ir0.04Rh0.04Pd0.03Os0.02)Σ=1.05As0.95.  
(2) Onverwacht mine, South Africa; by electron microprobe, corresponding to (Ru0.51Rh0.47Ni0.02Pt0.01Pd0.01)Σ=1.02(As0.99Sb0.02)Σ=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 ARSENNic in the composition.

Type Material:  
Canadian Museum of Nature, Ottawa, Canada.

References:  
(2) (1976) Amer. Mineral., 61, 177 (abs. ref. 1).  