Tolovkite IrSbS

Crystal Data: Cubic. *Point Group:* n.d. As aggregates of corroded, anhedral grains that define a skeletal isometric outline, to 72 μm.

Physical Properties: *Fracture:* Conchoidal. *Tenacity:* Brittle. Hardness = Very hard. VHN = 1431–1703 (10 g load). D(meas.) = n.d. D(calc.) = 10.50

Optical Properties: Opaque. *Color:* Steel-gray; gray with a pale brown tint in reflected light. *Luster:* Metallic.

R: (442) 36.7, (468) 39.0, (484) 39.9, (525) 42.0, (554) 42.5, (586) 42.9, (621) 43.5, (666) 43.8, (699) 44.0

Cell Data: *Space Group:* n.d. a = 6.027(3) Z = 4

X-ray Powder Pattern: Tolovka River, Russia.
1.813 (100), 2.99 (90), 1.146 (90), 1.065 (90), 2.126 (80), 1.005(80), 1.233 (70)

Chemistry:

	(1)	(2)	(3)
Ir	55.60	55.00	55.55
Pt	0.25	0.69	
Os	0.12	0.49	
Ni	0.06	0.06	
Sb	35.00	34.70	35.19
S	9.22	9.20	9.26
Total	100.25	100.14	100.00

(1–2) Tolovka River, Russia; by electron microprobe, the average of which corresponds to $(Ir_{0.99}Pt_{0.01}Os_{0.01})_{\Sigma=1.01}Sb_{0.99}S_{0.99}$. (3) IrSbS.

Mineral Group: Cobaltite group.

Occurrence: In a placer derived from an Alpine-type gabbro massif (Tolovka River, Russia).

Association: Os–Ir alloys, laurite, pentlandite, heazlewoodite (Tolovka River, Russia).

Distribution: In Russia, from the Tolovka River placer, Ust'-Bel'skii massif, Magadan district [TL]; at the Voykar-Syn'ya and Rayiz massifs, Polar Ural Mountains. In the Similkameen River, British Columbia, Canada. From Fox Gulch, Goodnews Bay, Alaska, USA.

Name: For the type locality near the Tolovka River, Russia.

Type Material: Mining Institute, St. Petersburg, Russia; A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 72030.

References: (1) Razin, L.V., N.S. Rudashevskii, and G.A. Sidorenko (1981) Tolovkite, IrSbS, a new sulfoantimonide of iridium from the northeastern USSR. Zap. Vses. Mineral. Obshch., 110, 474–480 (in Russian). (2) (1982) Amer. Mineral., 67, 1076–1077 (abs. ref. 1). (3) Bayliss, P. (1989) Crystal chemistry and crystallography of some minerals within the pyrite group. Amer. Mineral., 74, 1168–1176. [??ck this, as paper not even in pyrite folder - and MFG 2004 gives it as structure ref??]