

**Crystal Data:** Cubic. *Point Group:*  $4/m\bar{3}2/m$ . As irregular subrounded grains to 200  $\mu\text{m}$ .

**Physical Properties:** *Cleavage:* None. *Fracture:* Irregular. *Tenacity:* n.d.  
Hardness = 5 VHN = 519 (25 g load). D(meas.) = n.d. D(calc.) = 11.205

**Optical Properties:** Opaque. *Color:* Black, yellowish white in reflected light. *Streak:* Silvery black. *Luster:* Metallic.  
*Optical Class:* Isotropic.  
R: (470) 45.4, (546) 51.0, (589) 54.1, (650) 57.45

**Cell Data:** *Space Group:*  $Fd\bar{3}m$ .  $a = 12.3530(4)$   $Z = 8$  (by analogy with isomertieite (Pd<sub>11</sub>Sb<sub>2</sub>As<sub>2</sub>)).

**X-ray Powder Pattern:** Miessijoki River, Lemmenjoki area, Finnish Lapland, Finland.  
2.182 (100), 2.376 (90), 1.544 (14), 1.862 (13), 1.261 (13), 2.519 (11), 1.608 (11)

Chemistry:	(1)	(2)
Pd	72.04	74.29
Pt	1.75	
Sn	2.13	
Sb	0.85	
As	8.77	9.51
Te	13.15	16.20
Bi	0.79	
Total	99.48	100.00

(1) Miessijoki River, Lemmenjoki area, Finnish Lapland, Finland; average of 10 electron microprobe analyses, corresponding to (Pd<sub>10.85</sub>Pt<sub>0.14</sub>) $\Sigma=10.99$ (As<sub>1.88</sub>Sb<sub>0.11</sub>) $\Sigma=1.99$ (Te<sub>1.65</sub>Sn<sub>0.29</sub>Bi<sub>0.06</sub>) $\Sigma=2.00$ .  
(2) Pd<sub>11</sub>As<sub>2</sub>Te<sub>2</sub>.

**Occurrence:** In heavy concentrate from glaciofluvial gravels and sands derived from mafic-ultramafic intrusions in a granulitic complex.

**Association:** Gold, platinum, sperrylite, cooperite, braggite, irarsite, laurite, isomertieite, mertieite II, atokite, and Pt-Fe, Pt-Cu, Os-Ir-Ru, Cu-Pt-Pd, Cu-Pd-Pt-Au, Pd-Au, and Au-Ag natural alloys, and pyrite, rutile, uraninite-thorianite, galena, wolframite, magnetite, ilmenite, chromite, hematite, columbite-tantalite, tapiolite, almandine, zircon.

**Distribution:** Miessijoki River, Lemmenjoki area, Inari Commune, Finnish Lapland, Finland.

**Name:** Honors Professor Ragnar Törnroos (b. 1943), University of Helsinki, Finland, who first reported a mineral of similar composition at Finnish Lapland.

**Type Material:** Natural History Museum, London, England, (2010,100).

**References:** (1) Kojonen, K.K., A.M. McDonald, C.J. Stanley, and B. Johanson (2011) Törnroosite, Pd<sub>11</sub>As<sub>2</sub>Te<sub>2</sub>, a new mineral species related to isomertierite from Miessijoki, Finnish Lapland, Finland. *Canadian Mineralogist*, 49, 1643-1651. (2) (2014) *Amer. Mineral.*, 99, 874-875 (abs. ref. 1).