Nielsenite $PdCu_3$

Crystal Data: Tetragonal. *Point Group*: 4*mm*. As droplet shaped or irregular grains, to 0.05 mm.

Physical Properties: *Cleavage*: None. *Fracture*: None. *Tenacity*: Sectile. Hardness = n.d. D(meas.) = n.d. D(calc.) = 9.53

Optical Properties: Opaque. *Color*: Steel gray; bright creamy white in reflected light.
Streak: Black. *Luster*: Metallic.
Optical Class: n.d.
R_1-R_2: (470) 57.6-47.5, (546) 60.85-50.8, (589) 62.8-53.0, (650) 66.7-57.5

Cell Data: *Space Group*: *P*4*mm* (synthetic). a = 3.7125(8) c = 25.62(1) Z = 4

X-ray Powder Pattern: Skaergaard intrusion, Kangerdlunssuaq area, East Greenland.
2.137 (100), 1.8596 (70), 1.3042 (60), 1.1181 (55), 1.8337 (40), 1.0663 (30), 0.8459 (25)

Chemistry:

	(1)	(2)
Pd	29.86	35.82
Pt	3.08	
Au	3.70	
Cu	61.96	64.18
Fe	0.59	
Pb	0.17	
Total	99.36	100.00

(1) Skaergaard intrusion, East Greenland; average of 11 EDS analyses, corresponding to $(Pd_{0.862}Au_{0.058}Pt_{0.049}Fe_{0.028}Pb_{0.003})(Cu_{2.996}Fe_{0.004})_{\Sigma=3}$.
(2) $PdCu_3$.

Occurrence: As the crystallized products of immiscible melts in thoelitic gabbro and that formed at temperatures at of below 508° C, in a highly differentiated layered intrusion.

Association: Bornite-chalcocite, bornite with trace Ni-Co and Zn sulfides, skaergaardite, keithconnite, vasilite, zvyagintsevite, (Cu,Pd,Au), (Pd,Cu,Sn), (Pt,Fe,Cu,Pd) alloys, and unnamed phases Au_3Cu and PdAuCu.

Distribution: Platinova Reef, Skaergaard intrusion, Kangerdlunssuaq area, East Greenland.

Name: Honors Troels F.D. Nielsen (b. 1950), a geologist with the Geological Survey of Denmark and Greenland.

Type Material: Geologisk Museum, Copenhagen K, Denmark, 2008.1.

References: (1) Macdonald, A.M., L.J. Cabri, N.S. Rudashevsky, C.J. Stanley, V.N. Rudashevsky, and K.C. Ross (2008) Nielsenite, $PdCu_3$, a new platinum-group intermetallic mineral species from the Skaergaard intrusion, Greenland. Can. Mineral., 46, 709–716. (2) (2009) Amer. Mineral., 94, 401 (abs. ref. 1).