Torryweiserite $Rh_5Ni_{10}S_{16}$

Crystal Data: Hexagonal. *Point Group*: $\bar{3}$ 2/*m*. As blocky grains to 50 μm, occasionally intergrowth with oberthürite.

Physical Properties: *Cleavage*: None. *Tenacity*: Brittle. *Fracture*: n.d. Hardness = n.d. D(meas.) = n.d. D(calc.) = 5.555

Optical Properties: Opaque. *Color*: In reflected light, slightly bluish compared to oberthürite, gray compared to chalcopyrite, zvyagintsevite, and keithconnite, and pale creamy brown compared to bornite and coldwellite. *Streak*: n.d. *Luster*: Metallic.
Optical Class: No discernible pleochroism, bireflectance, or anisotropy.
R: (470) 34.7, (546) 34.4, (589) 33.8, (650) 33.8

Cell Data: *Space Group*: *R* $\bar{3}$ *m*. *a* = 7.060(1) *c* = 34.271(7) Z = 3

X-Ray Diffraction Pattern: Marathon deposit, Coldwell alkaline complex, Ontario, Canada. 1.7797 (100), 3.029 (58), 1.2512 (49), 1.0226 (35), 3.080 (33), 1.9329 (30), 2.817 (23)

Chemistry:

	(1)	(2)
Rh	28.29	31.87
Ru	0.11	
Os	0.11	
Ir	1.60	
Pt	2.61	
Ni	17.60	36.36
Fe	9.22	
Co	1.89	
Cu	7.41	
S	31.03	31.78
Total	99.87	100.00

(1) Marathon deposit, Coldwell alkaline complex, Ontario, Canada; average EDS analysis; corresponding to $(Rh_{4.5}Pt_{0.22}Ir_{0.14}Ni_{0.11}Ru_{0.02}Os_{0.01})_{\Sigma=5.03}(Ni_{4.84}Fe_{2.71}Cu_{1.92}Co_{0.53})_{\Sigma=10.00}S_{15.96}$.
(2) $Rh_5Ni_{10}S_{16}$.

Occurrence: In a heavy-mineral concentrate from coarse-grained ophitic olivine gabbro.

Association: Vysotskite, Au-Ag alloy, isoferroplatinum, Ge-bearing keithconnite, majakite, coldwellite, cuprorhodsite-ferhodsite, kotulskite, mertieite-II, chalcopyrite, bornite, millerite, Rh-bearing pentlandite.

Distribution: From the W Horizon, Marathon Cu-PGE-Au deposit, Coldwell alkaline complex, Ontario, Canada. From the Sisim Placer Zone, Krasnoyarskiy kray, Russia.

Name: Honors Dr. Thorolf ('*Torry*') W. *Weiser* (b. 1938), for his work on platinum-group minerals, notably those found in deposits related to the Great Dyke (Zimbabwe) and the Bushveld complex (Republic of South Africa).

Type Material: Canadian Museum of Nature, Gatineau, Quebec, Canada (87181 and 87179).

References: (1) McDonald, A.M., I.M. Kjarsgaard, L.J. Cabri, K.C. Ross, D.E. Ames, L. Bindi, and D.J. Good (2021) Oberthürite, $Rh_3(Ni,Fe)_{32}S_{32}$ and torryweiserite, $Rh_5Ni_{10}S_{16}$, two new platinum-group minerals from the Marathon deposit, Coldwell Complex, Ontario, Canada: Descriptions, crystal-chemical considerations, and comments on the geochemistry of rhodium. Can. Mineral., 59, 1833-1863.