Torryweiserite

Crystal Data: Hexagonal. Point Group: \( \overline{3} 2/m \). As blocky grains to 50 \( \mu \text{m} \), occasionally intergrowth with oberthürite.

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: \( R \overline{3} m \). \( a = 7.060(1) \) \( c = 34.271(7) \) \( Z = 3 \)

X-Ray Diffraction Pattern: Marathon deposit, Coldwell alkaline complex, Ontario, Canada.

Chemistry:

\[
\begin{array}{ccc}
\text{Element} & (1) & (2) \\
\text{Rh} & 28.29 & 31.87 \\
\text{Ru} & 0.11 & \\
\text{Os} & 0.11 & \\
\text{Ir} & 1.60 & \\
\text{Pt} & 2.61 & \\
\text{Ni} & 17.60 & 36.36 \\
\text{Fe} & 9.22 & \\
\text{Co} & 1.89 & \\
\text{Cu} & 7.41 & \\
\text{S} & 31.03 & 31.78 \\
\text{Total} & 99.87 & 100.00 \\
\end{array}
\]

(1) Marathon deposit, Coldwell alkaline complex, Ontario, Canada; average EDS analysis; corresponding to \((\text{Rh}_4.4\text{Pt}_{0.22}\text{Ir}_{0.14}\text{Ni}_{0.11}\text{Ru}_{0.02}\text{Os}_{0.01})_2\cdot\text{S}_3\cdot\text{Fe}_{2.71}\text{Cu}_{1.92}\text{Co}_{0.53}\text{S}_{15.96}\). (2) \( \text{Rh}_5\text{Ni}_{10}\text{S}_{16} \).

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

Association: Vysotskite, Au-Ag alloy, isoferooplatinum, 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, Krasnoyarsky 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, \( \text{Rh}_5(\text{Ni,Fe})_3\text{S}_8 \) and torryweiserite, \( \text{Rh}_5\text{Ni}_{10}\text{S}_{16} \), 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.