Moncheite $(\text{Pt}, \text{Pd})(\text{Te}, \text{Bi})_2$

Crystal Data: Hexagonal. *Point Group:* $\overline{3}\, 2/m$. Euhedral to subhedral crystals, to 1 mm, and as minute grains.

Physical Properties: *Cleavage:* On {0001}. Hardness = n.d. VHN = 73–111, 92 average; 124–168; 128–153 (10 g load). D(meas.) = n.d. D(calc.) = 9.88

Optical Properties: Opaque. *Color:* Steel-gray; in polished section, white. *Luster:* Metallic. *Pleochroism:* Weak in air, distinct in oil. *Anisotropism:* Strong, except close to $\perp$ {0001}.
R_1–R_2: (400) 50.3–51.6, (420) 51.5–52.6, (440) 52.4–53.5, (460) 53.4–54.4, (480) 54.2–55.1, (500) 54.9–55.8, (520) 55.5–56.4, (540) 56.0–56.9, (560) 56.4–57.3, (580) 56.7–57.6, (600) 57.1–58.0, (620) 57.4–58.4, (640) 57.7–58.7, (660) 58.0–59.0, (680) 58.3–59.2, (700) 58.4–59.4

Cell Data: *Space Group:* $P\overline{3}m1$. a = 4.049 c = 5.288 Z = 1

X-ray Powder Pattern: Monchegorsk deposit, Russia.
2.93 (100), 2.11 (80), 2.02 (70), 1.462 (70), 1.282 (70), 5.32 (60), 1.664 (7)

Chemistry:

	(1)	(2)	(3)
Pt	26.6	38.3	42.1
Pd	6.93		0.0
Bi	20.93	13.0	1.2
Te	45.55	49.1	56.7
Total	100.0	100.4	100.0

(1) Monchegorsk deposit, Russia; average of microspectrographic analyses of four samples, corresponding to $(\text{Pt}_{0.60}\text{Pd}_{0.28})_{\Sigma=0.88}(\text{Te}_{1.56}\text{Bi}_{0.44})_{\Sigma=2.00}$. (2) Impala mine, Transvaal, South Africa; by electron microprobe, corresponding to $(\text{Pt}_{0.88}(\text{Te}_{1.72}\text{Bi}_{0.28})_{\Sigma=2.00}$. (3) Stillwater complex, Montana, USA; by electron microprobe, corresponding to $\text{Pt}_{0.06}(\text{Te}_{1.97}\text{Bi}_{0.03})_{\Sigma=2.00}$.

Mineral Group: Melonite group.

Occurrence: Typically in small amounts in Pt–Pd-bearing massive Cu–Ni sulfide deposits.

Association: Merenskyite, melonite, sobolevskite, michenerite, kotulskite, froodite, sperrylite, cooperite, laurite, braggite, insizwaite, gold, pyrrhotite, pentlandite, chalcopyrite, pyrite.

Distribution: In Russia, from the Monchegorsk deposit, Monche Tundra, Kola Peninsula [TL]; and at the Oktyabr mine, Noril'sk region, western Siberia. In South Africa, from several mines along the Merensky Reef, Bushveld complex, Transvaal. In the USA, at the Stillwater complex, Montana; from the New Rambler Cu–Ni mine, Medicine Bow Mountains, east of Encampment, Albany Co., Wyoming; at the Key West mine, east of Moapa, Bunkerville district, Clark Co., Nevada; and in gravels of the San Joaquin River, at Friant, Fresno Co., California. In Canada, at Sudbury, in the Strathcona and Thierry mines, near Pickle Lake, and the Lac des Iles complex, Ontario; from the Wellgreen Ni–Cu–PGE deposit, Yukon Territory. At Kambalda, 56 km south of Kalgoorlie, Western Australia. A number of additional localities are now known.

Name: For the locality at Monche Tundra in Russia.

Type Material: Geology Museum, Kola Branch, Academy of Sciences, Apatity, 5966; A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 64852.

References: (1) Genkin, A.D., N.N. Zhuravlev, and E.M. Smirnova (1963) Moncheite and kotulskite—new minerals—and the composition of michenerite. Zap. Vses. Mineral. Obshch., 92, 33–50 (in Russian). (2) (1963) Amer. Mineral., 48, 1181 (abs. ref. 1). (3) X-Ray Laboratory, Guiyang Institute of Geochemistry, Academia Sinica (1975) The crystal structures of biteplapalladite and biteplatinite. Geochimica, 184–185 (in Chinese). (4) (1976) Mineral. Abs., 27, 214 (abs. ref. 3). (5) Volborth, A., M. Tarkian, E.F. Stumpfl, and R.M. Housley (1986) A survey of the Pd–Pt mineralization along the 35-km strike of the J-M reef, Stillwater Complex, Montana. Can. Mineral., 24, 329–346. (6) Cabri, L.J., Ed. (1981) Platinum group elements: mineralogy, geology, recovery. Can. Inst. Min. & Met., 121. (7) Criddle, A.J. and C.J. Stanley, Eds. (1993) Quantitative data file for ore minerals, 3rd ed. Chapman & Hall, London, 379–381.