Avicennite Tl_2O_3

Crystal Data: Cubic. *Point Group:* $2/m\ \overline{3}$. As crystals, less than 1 mm, some showing subhedral octahedral faces; as porous grains, and as a coating on carlinite.

Physical Properties: *Fracture:* Conchoidal to hackly, uneven. *Tenacity:* Very brittle. Hardness = 1.5–2.5 VHN = 46–80 (15 and 25 g loads). D(meas.) = 8.9 D(calc.) = 10.34

Optical Properties: Opaque. *Color:* Grayish black with brownish black tint; pale to medium gray under reflected light. *Streak:* Grayish black, black with a brownish tint. *Luster:* Metallic. *Optical Class:* Isotropic.
R: (400) 11.5, (470) 12.5, (500) 13.0, (546) 12.7, (589) 12.3, (650) 10.6, (700) 11.5

Cell Data: *Space Group:* $Ia3$. a = 10.5468(3) Z = 16

X-ray Powder Pattern: Carlin mine, Nevada, USA.
3.044 (100), 1.864 (38), 2.637 (37), 1.590 (30), 4.307 (17), 2.068 (7), 2.486 (6)

Chemistry: (1) Near Dzhuzumli, Tajikistan; Tl 79.52% by microchemical methods, corresponding to Tl_2O_3 88.86%, Fe_2O_3 4.46% an impurity. (2) Carlin mine, Nevada, USA; by electron microprobe, average of three analyses, Tl 89.6% corresponding to Tl_2O_3 100.1%.

Occurrence: In the weathered zone of a hematite-calcite vein cutting banded marmorized and silicified limestones near a granite-gneiss contact (near Dzhuzumli, Tajikistan); formed by oxidation of carlinite in carbonaceous gold ores in silicified limestones and quartz (Carlin mine, Nevada, USA).

Association: Hematite, "limonite", ferruginous clay minerals (near Dzhuzumli, Tajikistan); carlinite, hematite, quartz (Carlin mine, Nevada, USA); parapierrotite (Lookout Pass, Utah, USA).

Distribution: From near the village of Dzhuzumli, Mt. Zirabulaksk region, Samarkand district, western Uzbekistan. In the USA, from the Carlin mine, 50 km northwest of Elko, Lynn district, Eureka Co., Nevada, and near Lookout Pass, Tooele Co., Utah.

Name: For the medieval Uzbek (Persian) scholar and physician, Abū 'Alī al-Husayn ibn 'Abd Allāh ibn Sīnā (Avicenna) (930–1037), who lived in Bukhara, Tajikistan.

Type Material: n.d.

References: (1) Karpova, K.N., E.A. Kon'kova, E.D. Larkin, and V.F. Savel'ev (1958) Avicennite, a new mineral. Dokl. Akad. Nauk Uzbekistan SSR, 2, 23–26 (in Russian). (2) (1959) Amer. Mineral., 44, 1324–1325 (abs. ref. 1). (3) Kon'kova, E.A. and V.F. Savel'ev (1960) A new thallium mineral – avicennite. Zap. Vses. Mineral. Obshch., 89, 316–320 (in Russian). (4) Vlasov, K.A., Ed. (1966) Mineralogy of rare elements, v. II, 604–605. (5) Radtke, A.S., F.W. Dickson, and J.F. Slack (1978) Occurrence and formation of avicennite, Tl_2O_3, as a secondary mineral at the Carlin gold deposit, Nevada. J. Res. U.S. Geol. Surv., 6, 241–246.