Cobaltomenite $CoSe^{4+}O_3 \cdot 2H_2O$

Crystal Data: Monoclinic. *Point Group:* $2/m$. Crystals exhibit {001}, {100}, {010}, and less prominent {101}, to 1 mm; typically as spherical aggregates or crusts.

Physical Properties: *Fracture:* Conchoidal. Hardness = 2.5 D(meas.) = 3.42 D(calc.) = 3.422 (synthetic).

Optical Properties: Transparent to translucent. *Color:* Rose-red, peach-blossom-pink to brownish pink, pale brown to yellowish brown with increasing nickel content. *Luster:* Vitreous. *Optical Class:* Biaxial (–) (synthetic). *Pleochroism:* X = pale pink; Y = pink; Z = red. *Orientation:* $Z \wedge c = 13°$. *Dispersion:* $r < v$. *Absorption:* $Z > Y > X$. $\alpha = 1.681$ $\beta = 1.728$ $\gamma = 1.769$ 2V(meas.) = 83°

Cell Data: *Space Group:* $P2_1/n$ (synthetic). $a = 6.496(1)$ $b = 8.809(2)$ $c = 7.619(2)$ $\beta = 98.87(1)°$ Z = 4

X-ray Powder Pattern: Synthetic; close to ahlfeldite.
5.70 (100), 3.46 (70), 3.017 (55), 3.80 (50), 2.738 (45), 2.378 (40), 1.734 (35)

Chemistry: (1) Composition established by concurrence of properties with those of synthetic material.

Polymorphism & Series: Forms a series with ahlfeldite.

Occurrence: A secondary mineral in the oxidation zone of hydrothermal selenium-sulfide-bearing vein deposits.

Association: Chalcomenite, molybdomenite (Cerro de Cacheuta, Argentina); chalcomenite, clinochalcomenite, lepidocrocite, gypsum (El Dragón mine, Bolivia).

Distribution: From Cerro de Cacheuta, Mendoza Province, Argentina. At the El Dragón mine, 30 km southwest of Cerro Rico de Potosí, Potosí, and in the Pacajake mine, Hiaco, 30 km east-northeast of Colquechaca, Potosí, Bolivia. From the Musonoi and Kambove West mines, Shaba Province, Congo (Zaire). In the USA, at the A.E.C. No. 8 mine, Temple Mountain, Emery Co., and at the Parco mine group, Thompson district, Grand Co., Utah.

Name: For the content of *cobalt* and the Greek for *moon*.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 639. (2) Aristarain, L.F. and C.S. Hurlbut, Jr. (1969) Ahlfeldite from Pacajake Bolivia; a restudy. Amer. Mineral., 54, 448–456. (3) Sturman, B.D. and J.A. Mandarino (1974) The ahlfeldite-cobaltomenite series. Can. Mineral., 12, 304–307. (4) Wildner, M. (1990) Crystal structure refinements of synthetic cobaltomenite ($CoSeO_3 \cdot 2H_2O$) and ahlfeldite ($NiSeO_3 \cdot 2H_2O$). Neues Jahrb. Mineral., Monatsh., 353–362.