Metahewettite $CaV_6^{5+}O_{16}\cdot 3H_2O$

Crystal Data: Monoclinic. *Point Group:* $2/m$. As microscopic laths or tablets, flattened on {001}, in parallel or radial fibrous masses, pulverulent, and as coatings.

Physical Properties: Hardness = Soft. D(meas.) = 2.94 D(calc.) = 3.05 Reversibly hydrates to hewettite.

Optical Properties: Semitransparent. *Color:* Deep red; in transmitted light, red to orange. *Streak:* Maroon to brownish red. *Luster:* Dull to somewhat silky.
Optical Class: Biaxial (–). *Pleochroism:* X = light yellow-orange; Y = deep red; Z = deeper red. *Orientation:* $X = c$; $Y = b$; $Z = a$. $\alpha = 1.70$ $\beta = 2.10$ $\gamma = \sim 2.23$ 2V(meas.) = n.d. 2V(calc.) = 52°

Cell Data: *Space Group:* $A2/m$. $a = 12.15(1)$ $b = 3.607(3)$ $c = 18.44(1)$ $\beta = 118°2(3)'$ Z = 2

X-ray Powder Pattern: Monument No. 2 mine, Arizona, USA.
8.19 (100), 3.578 (30), 2.812 (24), 2.206 (22), 3.062 (18), 2.295 (17), 5.36 (12)

Chemistry: No analyses appear to have been made. Existence of the trihydrate has been inferred from dehydration-rehydration studies of hewettite and unit cell volume calculations.

Occurrence: As an impregnation in sandstone (Colorado Plateau-type U–V deposits).

Association: Hewettite, gypsum, selenium.

Distribution: In the USA, in the Jo Dandy and Hummer mines, Paradox Valley, Montrose Co., Colorado; from the Cactus Rat mine group, Yellow Cat district, 24 km southeast of Thompson, Grand Co., Utah; in Arizona, at the Monument No. 2 mine, Monument Valley, Apache Co.; in the Ambrosia Lakes district, McKinley Co., New Mexico; from near Post, Crook Co., Oregon; and near Cockalorum Wash, Nye Co., Nevada. In several mines of the Kurumsak and Balasauskandyk districts, northwestern Kara-Tau Mountains, Kazakhstan.

Name: For its relation to *hewettite* and its lesser H_2O content.

Type Material: Harvard University, Cambridge, Massachusetts, 93306; National Museum of Natural History, Washington, D.C., USA, 93305–93308.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 1061–1062. (2) Bayliss, P. (1979) X-ray powder data for metahewettite. Mineral. Mag., 43, 550. (3) Bayliss, P. (1982) X-ray powder data for hewettite. Mineral. Mag., 46, 503–504. (4) Evans, H.T., Jr. and J.M. Hughes (1990) Crystal chemistry of the natural vanadium bronzes. Amer. Mineral., 75, 508–521, esp. 513–514.