Hummerite $K_2Mg_2V_{10}^{5+}O_{28}\cdot 16H_2O$

Crystal Data: Triclinic (after recrystallization). *Point Group:* $\overline{1}$. Massive, in veins and efflorescences.

Physical Properties: Hardness = n.d. D(meas.) = n.d. D(calc.) = [2.53] Soluble in H_2O, from which it may be recrystallized.

Optical Properties: Translucent. *Color:* Bright orange.
Optical Class: Biaxial (–) (recrystallized). *Dispersion:* Strong. α = n.d. $\beta = 1.81$ γ = n.d. 2V(meas.) = n.d.

Cell Data: *Space Group:* $P\overline{1}$. $a = 10.735(2)$ $b = 11.085(2)$ $c = 8.831(1)$ $\alpha = 106.01(1)^\circ$ $\beta = 108.04(1)^\circ$ $\gamma = 65.81(1)^\circ$ Z = [2]

X-ray Powder Pattern: Hummer mine, Colorado, USA.
8.2 (10), 7.4 (7), 2.73 (6), 7.0 (5), 3.31 (4), 3.13 (4), 2.11 (4)

Chemistry: No chemical analysis has been performed; characterized by correspondence of properties with synthetic material.

Occurrence: Leached from vanadium oxide ores and deposited in veins in clay and as efflorescences on sandstone.

Association: Huemulite, rossite, thenardite, gypsum, epsomite (Malargüe district, Argentina).

Distribution: In the USA, in the Hummer mine, Jo Dandy group, and the North Star mine, Paradox Valley, Uravan district, Montrose Co., Colorado; in the Mesa No. 1 mine, Lukachukai Mountains, Apache Co., Arizona; from the Grants district, McKinley Co., New Mexico; in the Corvusite mine, Beaver Mesa, La Sal Mountains, Grand Co., Utah; and in the Gold Quarry mine, near Carlin, Maggie Creek district, Eureka Co., Nevada. From the Malargüe district, Mendoza Province, Argentina.

Name: For the Hummer mine, Colorado, USA, where it occurs.

Type Material: Harvard University, Cambridge, Massachusetts, 102345; National Museum of Natural History, Washington, D.C., USA, 106899.

References: (1) Weeks, A.D., E.A. Cisney, and A.M. Sherwood (1951) Hummerite and montroseite, two vanadium minerals from Montrose County, Colorado. Proceedings of the 31st Annual Meeting. Amer. Mineral., 36, 326–327 (abs.). (2) Evans, H.T., Jr., M.E. Mrose, and R. Marvin (1955) Constitution of the natural and artificial decavanadates. Proceedings of the 35th Annual Meeting. Amer. Mineral., 40, 314–315 (abs.). (3) Griffen, D.T. (1990) The crystal structure of hummerite, with comments on the crystallochemical stability of the decavanadate isopolyanion. Geology Studies, 36, 1–14. (4) Traill, R.J. and A.P. Sabina (1960) Catalogue of X-ray diffraction patterns and specimen mounts on file at the Geological Survey of Canada. Geol. Sur. of Canada, Paper 60-4, 50.