

**Crystal Data:** Triclinic. *Point Group:*  $\bar{1}$ . Massive, in veins and efflorescences.

**Physical Properties:** Hardness = n.d.  $D(\text{meas.}) = \text{n.d.}$   $D(\text{calc.}) = [2.53]$  Soluble in  $\text{H}_2\text{O}$ , from which it may be recrystallized.

**Optical Properties:** Translucent. *Color:* Bright orange.

*Optical Class:* Biaxial (–) (recrystallized).  $\alpha = \text{n.d.}$   $\beta = 1.81$   $\gamma = \text{n.d.}$   $2V(\text{meas.}) = \text{n.d.}$

*Dispersion:* Strong.

**Cell Data:** *Space Group:*  $P\bar{1}$ .  $a = 8.8178(4)$   $b = 10.7236(5)$   $c = 11.0707(5)$   $\alpha = 65.798(1)^\circ$   
 $\beta = 74.057(1)^\circ$   $\gamma = 71.853(1)^\circ$   $Z = [2]$

**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:** Qualitative energy-dispersion analysis showed only K, Mg, V, and O; originally characterized by correspondence of properties with synthetic material.

**Occurrence:** Leached from vanadium oxide ores and deposited in veins in clay and as efflorescences on bedded or roll-front U-V deposits in sandstone.

**Association:** Huemulite, rossite, thenardite, gypsum, epsomite (Malargüe district, Argentina); gypsum, huemulite, metamunirite, munirite, bluestreakite (Blue Streak mine, USA).

**Distribution:** In the USA, in the Hummer mine, Blue Streak 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. At the Ronneburg deposit, Thuringia, Germany.

**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. *Brigham Young Univ., 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. Canada, Paper 60-4*, 50. (5) Hughes, J.M., M. Schindler, J. Rakovan, and F.E. Cureton (2002) The crystal structure of hummerite,  $\text{KMg}(\text{V}_5\text{O}_{14})\cdot 8\text{H}_2\text{O}$ : bonding between the  $[\text{V}_{10}\text{O}_{28}]^{6-}$  structural unit and the  $\{\text{K}_2\text{Mg}_2(\text{H}_2\text{O})_{16}\}^{6+}$  interstitial complex. *Can. Mineral.*, 40, 1429-1435. (6) (2003) *Amer. Mineral.*, 88, 1179 (abs. ref. 5).