Hummerite  \( \text{K}_2\text{Mg(V}_{5+5}\text{O}_{14})\cdot 8\text{H}_2\text{O} \)

**Crystal Data:** Triclinic. \( \text{Point Group:} \ \bar{1} \). 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. \( \text{Color:} \ \text{Bright orange.} \)
\( \text{Optical Class:} \ \text{Biaxial (}-\text{)} \text{(recrystallized).} \ \alpha = \text{n.d.} \ \beta = 1.81 \ \gamma = \text{n.d.} \)
\( \text{Dispersion:} \ \text{Strong.} \)

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

**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 Corvisite 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:**
5. Hughes, J.M., M. Schindler, J. Rakovan, and F.E. Cureton (2002) The crystal structure of hummerite, \( \text{K}_2\text{Mg(V}_{10}\text{O}_{28})\cdot 8\text{H}_2\text{O} \): bonding between the \( [\text{V}_{10}\text{O}_{28}]^{16}\) structural unit and the \( [\text{K}_2\text{Mg(H}_2\text{O})_{16}]^{6+} \) interstitial complex. Can. Mineral., 40, 1429-1435.