Hexahydrite $MgSO_4 \cdot 6H_2O$

Crystal Data: Monoclinic. *Point Group:* $2/m$. Very rare crystals, thick tabular {001}; typically coarse columnar to thin fibrous, to 10 cm; massive. *Twinning:* On {001}; on {110}.

Physical Properties: *Cleavage:* On {100}, perfect. *Fracture:* Conchoidal. Hardness = 2–2.5 (by analogy to epsomite). D(meas.) = 1.757 D(calc.) = 1.745 Soluble in H_2O, bitter salty taste.

Optical Properties: Transparent to opaque. *Color:* Colorless to white, may be pale green; colorless in transmitted light. *Luster:* Pearly to vitreous.
Optical Class: Biaxial (–). *Orientation:* $Y = b$; $X \wedge c = 25°$. $\alpha = 1.426$ $\beta = 1.453$ $\gamma = 1.456$ 2V(meas.) = 38°

Cell Data: *Space Group:* $C2/c$. $a = 10.110(5)$ $b = 7.212(4)$ $c = 24.41(1)$ $\beta = 98.30(5)°$ Z = 8

X-ray Powder Pattern: Synthetic. (ICDD 24–719).
4.39 (100), 5.45 (50), 5.10 (45), 4.04 (45), 4.16 (35), 4.88 (30), 2.941 (30)

Chemistry:

	(1)	(2)
SO_3	34.52	35.04
MgO	17.15	17.64
H_2O	46.42	47.32
insol.	1.78	
Total	99.87	100.00

(1) Bonaparte River, Canada. (2) $MgSO_4 \cdot 6H_2O$.

Mineral Group: Hexahydrite group.

Occurrence: By dehydration of epsomite; as efflorescences on magnesian rock exposures and in mine workings; as speleothems in caves; may be widespread as an evaporative precipitate in saline lakes and soils; rarely a fumarolic precipitate.

Association: Epsomite, siderotil.

Distribution: Likely more widespread than the following list of localities indicates. In Canada, from along the Bonaparte River between Scottie and Carquill Creeks, Clinton district, British Columbia; along Rapid Creek, Yukon Territory. In the USA, from near Oroville, Okanogan Co., Washington; in the Campbell mine, Bisbee, Cochise Co. and the San Manuel mine, Pinal Co., Arizona; long fibers from the Nevada Dominion adit, Pyramid district, Washoe Co., Nevada; in the Long Park #15 mine, Montrose Co., Colorado; at Sterling Hill, Sussex Co., New Jersey; from Alum Cave Bluff, Sevier Co., Tennessee. In the North Ballaird Bore No. 3, Balsalloch Farm, near Ballantrae, Ayrshire, Scotland. In Germany, at Wathlingen, Lower Saxony, and elsewhere. From Kladno and Kelčany, Czech Republic. At Boleslaw, Poland. In Turkey, from the Great Konya Basin, near Çakmak, Konya Province. At the Saki salt lakes, Crimea, Ukraine. A volcanic sublimate at volcanoes on the Kamchatka Peninsula, Russia. In the Epsom Pot Cave, Transvaal, South Africa. At the Santa Bárbara sulfur mine, El Palmar district, Jujuy Province, Argentina.

Name: With the Greek prefix, *hexa*, in recognition of a magnesium sulfate *hydrate* with six essential water molecules.

Type Material: n.d.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 494–495. (2) Zalkin, A., H. Ruben, and D.H. Templeton (1964) The crystal structure and hydrogen bonding of magnesium sulfate hexahydrate. Acta Cryst., 17, 235–240.