Magnesium-zippeite $Mg_2(UO_2)_6(SO_4)_3(OH)_{10}\cdot 16H_2O$

Crystal Data: Orthorhombic. *Point Group:* $2/m$. As fine-grained efflorescences.

Physical Properties: Hardness = ∼2 D(meas.) = > 3.3 D(calc.) = n.d. Radioactive; fluoresces bright yellow under SW and LW UV.

Optical Properties: Semitransparent. *Color:* Yellow-orange to orange-tan.
Optical Class: Biaxial. *Pleochroism:* X = pale yellow; Y = yellow; Z = dark yellow. $\alpha = 1.72$ $\beta = 1.75$ $\gamma = 1.82$ 2V(meas.) = Moderate to large.

Cell Data: *Space Group:* $C2/c$ (by analogy to zippeite). $a = 8.649(1)$ $b = 14.241(2)$ $c = 17.696(2)$ $\beta = 104.11(5)°$ Z = 8

X-ray Powder Pattern: Lucky Strike No. 2 mine, Utah, USA.
3.58 (10), 7.2 (8), 3.48 (8), 3.11 (6), 2.74 (3), 2.88 (2), 2.52 (2)

Chemistry:

	(1)	(2)
SO_3	5.0	9.94
UO_3	74.6	71.06
CoO	1.4	
MgO	6.2	3.34
H_2O	10.9	15.66
Total	98.1	100.00

(1) Lucky Strike No. 2 mine, Utah, USA; by microchemical analysis; identification primarily established by correspondence of its X-ray powder pattern with that of synthetic material.
(2) $Mg_2(UO_2)_6(SO_4)_3(OH)_{10}\cdot 16H_2O$.

Occurrence: A rare post-mine mineral on the walls of mine tunnels.

Association: Sodium-zippeite, gypsum, bieberite, cobaltocalcite, rabbittite (Lucky Strike No. 2 mine, Utah, USA); uranopilite, zippeite, sodium-zippeite, nickel-zippeite, johannite, cuprosklodowskite, sklodowskite, metaschoepite (Jáchymov, Czech Republic).

Distribution: From the Lucky Strike No. 2 mine, Emery Co., Utah, USA. In the Evangelista vein, Jáchymov (Joachimsthal), Czech Republic.

Name: For its content of *magnesium* and relation to *zippeite*.

Type Material: n.d.

References: (1) Frondel, C., J. Ito, R.M. Honea, and A.M. Weeks (1976) Mineralogy of the zippeite group. Can. Mineral., 14, 429–436. (2) Haacke, D.F. and P.A. Williams (1979) The aqueous chemistry of uranium minerals. Part I. Divalent cation zippeïte. Mineral. Mag., 43, 539–541. (3) Ondruš, P., F. Veselovský, J. Hloušek, R. Skála, I. Vavřín, J. Frýda, J. Čejka, and A. Gabašová (1997) Secondary minerals of the Jáchymov (Joachimsthal) ore district. J. Czech Geol. Soc., 42(4), 3–76, esp. 31–32.