Leisingite $(Cu, Mg, Zn)_2(Mg, Fe^{2+})Te^{6+}O_6 \cdot 6H_2O$

Crystal Data: Hexagonal. *Point Group:* $3m$. Hexagonal plates, to 0.2 mm, prominent {0001} and $\{000\bar{1}\}$, with $\{10\bar{1}0\}$, $\{11\bar{2}0\}$; may be isolated or in clusters.

Physical Properties: *Cleavage:* {001}, perfect. *Fracture:* Uneven. *Tenacity:* Brittle to flexible. Hardness = 3–4 D(meas.) = n.d. D(calc.) = 3.41

Optical Properties: Transparent to translucent. *Color:* Pale yellow to pale yellow-orange. *Streak:* Pale yellow. *Luster:* Vitreous, may be satiny or frosted.
Optical Class: Uniaxial (–). $\omega = 1.803(3)$ $\epsilon = [1.581]$ calculated by Gladstone-Dale relation.

Cell Data: *Space Group:* $P\bar{3}1m$. $a = 5.316(1)$ $c = 9.719(2)$ $Z = 1$

X-ray Powder Pattern: Centennial Eureka mine, Utah, USA.
9.70 (100), 4.834 (80), 2.556 (70), 2.326 (70), 4.604 (60), 2.655 (60), 1.789 (40)

Chemistry:

	(1)
TeO_3	36.94
FeO	6.86
CuO	24.71
ZnO	0.45
MgO	6.19
H_2O	[21.55]
Total	[96.70]

(1) Centennial Eureka mine, Utah, USA; by electron microprobe, total Fe as Fe^{2+} [although the crystal-structure analysis indicates a probability of Fe^{3+}], H_2O confirmed as present by IR; corresponds to $(Cu^{2+}_{1.56}Mg_{0.25}Zn_{0.03})_{\Sigma=1.84}(Mg_{0.52}Fe_{0.48})_{\Sigma=1.00}Te^{6+}_{1.06}O_{6.02} \cdot 5.98H_2O$.

Occurrence: A very rare secondary mineral in dump material from the oxidized zone of a tellurium-bearing Cu–Au–Ag deposit.

Association: Quartz, jensenite, cesbronite, hematite.

Distribution: From the Centennial Eureka mine, Tintic district, Juab Co., Utah, USA.

Name: Honoring Joseph F. Leising (1949–), Reno, Nevada, USA, geologist and mineral collector, who helped collect the material.

Type Material: Canadian Geological Survey, Ottawa, Canada, 67882.

References: (1) Roberts, A.C., L.A. Groat, J.D. Grice, R.A. Gault, and M.C. Jensen (1996) Leisingite, $Cu(Mg, Cu, Fe, Zn)_2Te^{6+}O_6 \cdot 6H_2O$, a new mineral species from the Centennial Eureka mine, Juab County, Utah. Mineral. Mag., 60, 653–657. (2) (1997) Amer. Mineral., 82, 208 (abs. ref. 1). (3) Margison, S.M., J.D. Grice, and L.A. Groat (1997) The crystal structure of leisingite, $(Cu^{2+}, Mg, Zn)_2(Mg, Fe)Te^{6+}O_6 \cdot 6H_2O$.