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Crystal Data: Monoclinic. *Point Group:* 2/m. Crystals are short prismatic, to 1.8 mm; in stalactites, crusts, granular and massive columnar aggregates.

Physical Properties: Fracture: Uneven. Hardness = 2-2.5 D(meas.) = 2.02-2.03 D(calc.) = 1.93 Dehydrates readily under ambient conditions.

Optical Properties: Transparent. *Color:* Yellowish green, greenish blue, apple-green; very pale blue-green in transmitted light. *Streak:* White. *Luster:* Vitreous to resinous. *Optical Class:* Biaxial (+). *Orientation:* $Y \wedge$ elongation $\simeq 34^{\circ}$. *Dispersion:* Slight. $\alpha = 1.477-1.479$ $\beta = 1.483-1.487$ $\gamma = 1.488-1.489$ $2V(\text{meas.}) = 80^{\circ}-90^{\circ}$ $2V(\text{calc.}) = 78.7^{\circ}$

Cell Data: Space Group: $[P2_1/c]$ (by analogy with the melanterite group). Z = 4

X-ray Powder Pattern: n.d.

Chemist

ry:		(1)	(2)	(3)
	SO_3	28.78	28.66	27.93
	FeO	2.14	8.86	
	CuO	12.37	< 0.01	13.88
	ZnO	12.89	16.35	14.20
	MgO		1.40	
	CaO		0.14	
	H_2O	42.61	44.58	43.99
	insol.	1.11		
	Total	99.90	99.99	100.00

(1) Vulcan, Colorado, USA; corresponds to $(Zn_{0.46}Cu_{0.45}Fe_{0.09})_{\Sigma=1.00}(SO_4)_{1.04} \bullet 6.87H_2O.$

(2) Leh-Yang Co., China; average of two analyses; corresponds to $(Zn_{0.57}Fe_{0.35}Mg_{0.10}Ca_{0.02})_{\Sigma=1.04}$ $(SO_4)_{0.99} \bullet 6.88H_2O.$ (3) $(Zn, Cu)SO_4 \bullet 7H_2O$ with Zn:Cu = 1:1.

Mineral Group: Melanterite group.

Occurrence: A rare mineral formed in the oxidation zone of pyritic ore deposits.

Association: Sphalerite, chalcopyrite, pyrite.

Distribution: In the USA, from the Good Hope and Vulcan mines, Vulcan, Gunnison Co., Colorado. In Leh-Yang Co., southern Shaanxi Province, China.

Name: As the zinc-dominant member of the melanterite group.

Type Material: National Museum of Natural History, Washington, D.C., USA, 93244.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 508. (2) Tiegeng Liu, Guohong Gong, and Lin Ye (1995) Discovery and investigation of zinc-melanterite in nature. Acta Mineralogica Sinica, 15(3), 286–290 (in Chinese with English abs.).