Zincovoltaite $K_2Zn_5Fe^{3+}_3Al(SO_4)_{12}\cdot 18H_2O$

Crystal Data: Cubic. *Point Group:* $4/m\ \overline{3}\ 2/m$. Crystals show {111}, {100}, {110}, {211}, to 2 mm, in granular aggregates and irregular veinlets.

Physical Properties: *Fracture:* Conchoidal. *Tenacity:* Brittle. Hardness = ∼3
D(meas.) = 2.765 D(calc.) = 2.767 Slowly soluble in H_2O, decomposes on exposure to the atmosphere.

Optical Properties: Transparent to translucent. *Color:* Green-black to oil-green; yellowish green in transmitted light. *Streak:* Grayish green. *Luster:* Vitreous on crystal surfaces, pitchy to resinous.
Optical Class: Isotropic, anomalously uniaxial. $n = 1.605(3)$

Cell Data: *Space Group:* $Fd3c$. a = 27.180(1) Z = 16

X-ray Powder Pattern: Xitieshan mine, China.
3.39 (100), 3.54 (67), 5.53 (48), 3.13 (39), 3.84 (32), 4.24 (28), 3.03 (28)

Chemistry:

	(1)	(2)
SO_3	46.93	46.26
Al_2O_3	2.50	2.46
Fe_2O_3	11.21	11.53
FeO	3.20	
MnO	1.20	
ZnO	14.61	19.60
CaO	0.69	
K_2O	4.11	4.54
H_2O	15.69	15.61
Total	100.14	100.00

(1) Xitieshan mine, China; corresponding to $(K_{1.79}Ca_{0.25})_{\Sigma=2.04}(Zn_{3.69}Fe^{2+}_{0.91}Mn_{0.35})_{\Sigma=4.95}Fe^{3+}_{2.89}Al_{1.01}(SO_4)_{12.06}\cdot 17.92H_2O$. (2) $K_2Zn_5Fe^{3+}_3Al(SO_4)_{12}\cdot 18H_2O$.

Occurrence: In the oxidation zone of a Zn–Pb–Fe sulfide deposit, formed in an arid climate.

Association: Römerite, melanterite, gypsum, pyrite, quartz.

Distribution: From the Xitieshan Pb–Zn mine, south of Mt. Qilianshan, Chaidamu, Qinghai Province, China.

Name: As the *zinc* analog of *voltaite*.

Type Material: Lanzhou University, Lanzhou; Geological Museum, Ministry of Geology, Beijing, China.

References: (1) Wanmao Li, Guoying Chen, and Shurong Sun (1987) Zincovoltaite – a new sulfate mineral. Acta Mineralogica Sinica, 7, 307–312 (in Chinese with English abs.). (2) (1990) Amer. Mineral., 75, 244–245 (abs. ref. 1).