Wilcoxite $MgAl(SO_4)_2F \cdot 17–18H_2O$

Crystal Data: Triclinic. *Point Group:* $\overline{1}$ or 1. As stubby crystals, showing {010}, {110}, {100}, {$\overline{1}$10}, {0$\overline{1}$1}, typically with rounded edges, to about 1 mm, aggregated in thick crusts and spongy masses, may be stalactitic.

Physical Properties: *Fracture:* Conchoidal. Hardness = 1–2 D(meas.) = 1.58(1) D(calc.) = 1.67 Soluble in H_2O; slightly heated, it will dissolve in its own H_2O.

Optical Properties: Transparent. *Color:* Colorless, pale blue, pale green, becoming milky white on exposure to air. *Luster:* Greasy.
Optical Class: Biaxial (–). $\alpha = 1.424–1.425$ $\beta = 1.436$ $\gamma = 1.437–1.438$ 2V(meas.) = n.d. 2V(calc.) = 48°

Cell Data: *Space Group:* $P\overline{1}$ or $P1$. $a = 14.90$ $b = 6.65$ $c = 6.77$ $\alpha = 117°26'$ $\beta = 100°35'$ $\gamma = 89°10'$ Z = 1

X-ray Powder Pattern: Lone Pine mine, New Mexico, USA.
4.908 (10), 5.654 (9), 4.371 (6), 3.384 (5), 5.877 (4), 4.117 (4), 2.980 (4)

Chemistry:

	(1)	(2)	(3)
SO_3	27.50	27.89	27.29
SiO_2		0.29	
Al_2O_3	8.13	8.20	8.69
Fe_2O_3	0.46	0.30	
MnO	0.13		
MgO	6.61	7.25	6.87
F	3.48	4.00	3.24
H_2O	56.40	52.92	55.27
$-O = F_2$	1.47	1.68	1.36
Total	101.24	99.17	100.00

(1) Lone Pine mine, New Mexico, USA; by microanalysis, H_2O by the Penfield method.
(2) Deputatskoye deposit, Russia. (3) $MgAl(SO_4)_2F \cdot 18H_2O$.

Occurrence: A rare post-mine mineral deposited from solutions derived from an oxidizing breccia zone (Lone Pine mine, New Mexico, USA); in intensely oxidized cassiterite–tourmaline–quartz–polysulfide ore (Deputatskoye deposit, Russia).

Association: Fluorite, gypsum, khademite, lannonite, pyrite (Lone Pine mine, New Mexico, USA); melanterite, fibroferrite, gypsum, goethite, ice (Deputatskoye deposit, Russia).

Distribution: From the Lone Pine mine, Wilcox district, near Silver City, Catron Co., New Mexico, USA. In the Deputatskoye tin deposit, northeast Sakha, Russia. From the Valle del Cura, San Juan Province, Argentina.

Name: To honor William Wilcox (?–1880), discoverer of the Wilcox district, New Mexico, USA.

Type Material: Natural History Museum, Paris, France; The Natural History Museum, London, England, 1980,545; National Museum of Natural History, Washington, D.C., USA, 149525.

References: (1) Williams, S.A. and F.P. Cesbron (1983) Wilcoxite and lannonite, two new fluosulphates from Catron Co., New Mexico. Mineral. Mag., 47, 37–40. (2) (1984) Amer. Mineral., 69, 407 (abs. ref. 1). (3) Zhdanov, Y.Y., L.I. Solov'yev, and V.S. Suknev (1993) Wilcoxite from Yakutia [Sakha], its second find in the world. Doklady Acad. Nauk SSSR, 317, 136–139 (in English).