Szomolnokite $Fe^{2+}SO_4 \cdot H_2O$

Crystal Data: Monoclinic. *Point Group:* $2/m$. Small crystals are typically distorted, dipyramidal $\{\overline{1}11\}$ and $\{110\}$, tabular on $\{\overline{1}11\}$, commonly in parallel growths; globular to stalactitic. *Twinning:* Common, according to an undetermined law.

Physical Properties: *Fracture:* Conchoidal to uneven. *Tenacity:* Brittle. Hardness = 2.5 D(meas.) = 3.03–3.07 D(calc.) = 3.097 Slowly soluble in H_2O.

Optical Properties: Transparent when unoxidized. *Color:* Sulfur-yellow, yellowish brown to reddish brown; blue, colorless. *Luster:* Vitreous.
Optical Class: Biaxial (+). *Orientation:* $Y = b$; $X \wedge c = -26°$. *Dispersion:* $r > v$, strong.
$\alpha = 1.591$ $\beta = 1.623$ $\gamma = 1.663$ 2V(meas.) = 80°

Cell Data: *Space Group:* $C2/c$ (synthetic). $a = 7.078(3)$ $b = 7.549(3)$ $c = 7.773(3)$ $\beta = 118.65(2)°$ Z = 4

X-ray Powder Pattern: Synthetic.
3.444 (100), 3.116 (42), 2.521 (37), 4.85 (30), 2.579 (27), 3.373 (24), 3.282 (21)

Chemistry:

	(1)	(2)		(1)	(2)
SO_3	47.96	47.12	MgO	0.25	
Fe_2O_3	1.36		CaO	0.07	
FeO	39.42	42.28	$(Na,K)_2O$	0.31	
CuO	1.20		H_2O	10.36	10.60
ZnO	0.14		Total	101.07	100.00

(1) Smolník, Slovakia. (2) $FeSO_4 \cdot H_2O$.

Mineral Group: Kieserite group.

Occurrence: An uncommon secondary mineral formed in pyrite-rich oxidized sulfide deposits, typically under highly acid and arid conditions.

Association: Rhomboclase, halotrichite, fibroferrite, römerite, copiapite, voltaite, pyrite.

Distribution: Widespread in small amounts. Several localities for studied material include: from Smolník (Szomolnok), 16 km northeast of Rožňava, Slovakia. On Valachov Hill, near Skřivaň, and at Kladno, Czech Republic. From the Staszic mine, Rudki, Poland. In the Clara mine, near Oberwolfach, Black Forest, Germany. From the Crumlin colliery, Ebbw Vale, Gwent, Wales. At Quetena, west of Calama, and Alcaparrosa, near Cerritos Bayos, southwest of Calama, Antofagasta, Chile. From the Santa Elena mine, Quebrada de La Alcaparrosa, San Juan Province, Argentina. In the USA, from the Tintic Standard mine, near Dividend, East Tintic district, Utah Co., Utah; at Bisbee, Cochise Co. and in the Magma mine, Pinal Co., Arizona; from the Goldstrike mine, Lynn district, Eureka Co., Nevada; at the Island Mountain mine, Trinity Co., California. From Saghand, Yazd, Iran.

Name: For the first recognized occurrence at Szomolnok, Hungary (now Smolník, Slovakia).

Type Material: The type specimens were destroyed in 1956 at the Natural History Museum, Budapest, Hungary.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 479–480. (2) Pistorius, C.W.F.T. (1960) Lattice constants of $FeSO_4.H_2O$ (artificial szomolnokite) and $NiSiO_4.H_2O$. Bull. Soc. Chim. Belge., 69, 570–574. (3) Wildner, M. and G. Giester (1991) The crystal structures of kieserite-type compounds. I. Crystal structures of $Me(II)SO_4 \cdot H_2O$ (Me = Mn,Fe,Co,Ni,Zn). Neues Jahrb. Mineral., Monatsh., 296–306.