Crystal Data: Monoclinic. Point Group: 2/m. As prismatic crystals to 0.1 mm.

**Physical Properties**: *Cleavage*: Perfect on {100}, imperfect on {001}. *Tenacity*: Brittle. *Fracture*: Irregular. Hardness =  $\sim 2$  D(Meas.) = n.d. D(calc.) = 2.392 Slowly soluble in H<sub>2</sub>O.

**Optical Properties**: Transparent. *Color*: Orange-brown. *Streak*: Yellowish. *Luster*: Vitreous. *Optical Class*: n(calc.) = 1.564 *Pleochroism*: Distinct, tan to brownish.

**Cell Data**: Space Group:  $P2_1/c$ . a = 9.4797(2) b = 18.4454(5) c = 18.0540(4)  $\beta = 92.626(2)^{\circ}$  Z = 4

**X-Ray Diffraction Pattern**: Monte Arsiccio mine, Stazzema (LU), Apuan Alps, Tuscany, Italy. 8.2 (vs), 9.1 (s), 3.442 (m), 3.371 (m), 3.005 (m), 2.968 (m), 4.15 (mw)

Chemistry:		(1)	(2)
	$SO_3$	45.82	42.30
	$Fe_2O_3$	22.67	21.09
	K <sub>2</sub> O	22.72	20.74
	H <sub>2</sub> O	[17.18]	15.87
	Total	108.39	100.00

(1) Monte Arsiccio mine, Stazzema (LU), Apuan Alps, Tuscany, Italy; average electron microprobe and micro-Raman spectroscopic analyses,  $H_2O$  calculated, high total due to dehydration during analysis; corresponds to  $K_{5.06}Fe^{3+}_{2.98}O(SO_4)_{6.00}\cdot 10H_2O$ . (2)  $K_5Fe^{3+}_{3.0}O(SO_4)_{6.10}\cdot 10H_2O$ .

Occurrence: Secondary in a weathered, Tl-rich, pyrite-baryte-magnetite-hematite deposit.

Association: Alum-(K), gypsum, krausite, magnanelliite, scordariite.

**Distribution**: From the Monte Arsiccio mine, Stazzema (LU), Apuan Alps, Tuscany, Italy.

**Name**: Honors Carmelo *Giacovazzo* (b. 1940), retired Professor of Mineralogy and Crystallography, University of Bari, Italy, for his contributions to crystallography.

Type Material: Natural History Museum, University of Pisa, Italy (19896).

**References**: (1) Biagioni, C., L. Bindi, D. Mauro, and M. Pasero (2020) Crystal-chemistry of sulfates from the Apuan Alps (Tuscany, Italy). IV. Giacovazzoite,  $K_5Fe^{3+}_3O(SO_4)_6(H_2O)_9$ ·H<sub>2</sub>O, the natural analogue of the  $\beta$ -Maus's salt and its dehydration product. Physics and Chemistry of Minerals, 47(1), 7, 1-13.