Kamarizaite $Fe^{3+}_3(AsO_4)_2(OH)_3 \cdot 3H_2O$

Crystal Data: Triclinic. *Point Group*: $\bar{1}$. As aggregates to 3 cm composed of platy crystals to 1 μm and in submicron kidney-shaped segregations.

Physical Properties: *Cleavage*: None. *Fracture*: n.d. *Tenacity*: Brittle. Hardness = ~3
D(meas.) = 3.16(1) D(calc.) = 3.471

Optical Properties: Earthy. *Color*: Light yellow to beige. *Streak*: Light yellow.
Luster: Porcelain-like.
Optical Class: Biaxial (+). Nonpleochroic. n(min.) = 1.825 n(max.) = 1.835
n(average) = 1.83(1) (for a fine-grained aggregate)

Cell Data: *Space Group*: $P\bar{1}$. a = 7.7048(6) b = 8.0892(6) c = 10.2160(8) α = 68.304(6)°
β = 75.326(7)° γ = 63.534(6°) Z = 2

X-ray Powder Pattern: Kamariza mine, Lavrion mining district, Attica Region, Greece.
3.947 (100), 3.332 (60), 3.085 (58), 5.85 (52), 6.61 (37), 3.396 (37), 3.245 (34)

Chemistry:

	(1)
CaO	0.35
Fe_2O_3	41.78
As_2O_5	39.89
SO_3	1.49
H_2O	15.3
Total	98.81

(1) Kamariza mine, Lavrion mining district, Attica Region, Greece; average electron microprobe analysis supplemented by Mössbauer and IR spectroscopy, H_2O by TGA; corresponds to $Ca_{0.03}Fe^{3+}_{2.86}(AsO_4)_{1.90}(SO_4)_{0.10}(OH)_{2.74} \cdot 3.27H_2O$. (2) Le Mazet vein, Échassières, Auvergne, France; SEM-EDS analysis, analysis not given; corresponds to $(Fe^{3+}_{2.80}Al_{0.20})_{\Sigma=3.00}[(As_{1.93}P_{0.07})O_4]_2(OH)_3 \cdot 3H_2O$.

Occurrence: From supergene alteration of primary Pb-Zn ore.

Association: Goethite, scorodite, jarosite.

Distribution: The dump of the Kamariza mine, Lavrion mining district, Attica Region, Greece [TL]. From the Le Mazet vein, Échassières, Auvergne, France.

Name: For the mine where the first studied samples were collected.

Type Material: Mineralogical Collection, Technische Universität Bergakademie, Freiberg, Germany (82199).

References: (1) Chukanov, N.V., I.V. Pekov, S. Möckel, A.A. Mukhanova, D.I. Belakovskiy, L.A. Levitskaya, and G.K. Bekenova (2010) Kamarizaite $Fe^{3+}_3(AsO_4)_2(OH)_3 \cdot 3H_2O$ - a new mineral, arsenate analogue of tinticite. Geology of Ore Deposits 52, 599-605. (2) Kolitsch, U., C.L. Lengauer, and G. Giester (2016) Crystal structure and isotypism of the iron(III) arsenate kamarizaite and the iron(III) phosphate tinticite. Eur. J. Mineral., 28, 71-81. (3) Majzlan, J., U.G. Nielsen, E. Dachs, A. Benisek, P. Drahota, U. Kolitsch, J. Herrmann, R. Bolanz, and M. Števko (2018) Thermodynamic properties of mansfieldite ($AlAsO_4 \cdot 2H_2O$), angelellite ($Fe_4(AsO_4)_2O_3$) and kamarizaite ($Fe_3(AsO_4)_2(OH)_3 \cdot 3H_2O$). Mineral. Mag., 82, 1333-1354.