Kaatialaite $Fe^{3+}(H_2AsO_4)_3 \cdot 3–5H_2O$

Crystal Data: Monoclinic. *Point Group:* 2 or $2/m$. As acicular crystals, to 50 μm, in aggregates; as powdery coatings on löllingite.

Physical Properties: Hardness = n.d. D(meas.) = 2.64(2) (synthetic). D(calc.) = 2.64 H_2O is variable according to relative humidity; becomes cloudy on exposure to light.

Optical Properties: Semitransparent. *Color:* White, gray, greenish gray to yellow. *Luster:* Earthy.
Optical Class: Biaxial (+). *Orientation:* Z $\wedge$ c $\simeq 3°$. α = 1.573–1.581 β = 1.573–[1.582] γ = 1.626–1.636 2V(meas.) = 13°–15°

Cell Data: *Space Group:* $P2_1$ or $P2_1/n$ (synthetic $Fe(H_2AsO_4)_3 \cdot 5H_2O$). a = 15.25–15.363 b = 19.60–19.844 c = 4.72–4.752 β = 91.77°–91.90° Z = 4

X-ray Powder Pattern: Kaatiala pegmatite, Finland.
8.35 (vs), 9.91 (s), 7.72 (s), 6.09 (m), 3.76 (m), 3.53 (m), 3.408 (m)

Chemistry:

	(1)	(2)
As_2O_5	[51.9]	59.9
CO_2	1.73	
As_2O_3	[14.2]	
Al_2O_3	0.58	
Fe_2O_3	11.2	13.8
MgO	0.24	
CaO	3.00	
H_2O	16.2	25.8
Total	[99.05]	99.5

(1) Kaatiala pegmatite, Finland; by AA, As determined after volatilization of arsenolite impurity, H_2O and CO_2 by elemental analyzer; after deduction of small amounts of Ca, Mg, As_2O_3, CO_2 as impurities, corresponds to $(Fe_{0.93}Al_{0.08})_{\Sigma=1.01}(H_2AsO_4)_{3.00} \cdot 5.97H_2O$. (2) Niederbeerbach, Germany; corresponds to $Fe_{1.00}(H_2AsO_4)_{3.02} \cdot 5.26H_2O$.

Occurrence: A secondary mineral in a granite pegmatite (Kaatiala pegmatite, Finland); in an oxidized Ag–As vein in gabbro (Niederbeerbach, Germany).

Association: Arsenolite, löllingite, calcite, gypsum (Kaatiala pegmatite, Finland).

Distribution: From the Kaatiala pegmatite, near Kuortane, Finland. In Germany, at Glasberg, Niederbeerbach, Odenwald, Hesse; Wittichen, Black Forest; St. Andreasberg, Harz Mountains; and Lauta, near Marienberg, Saxony. From Jáchymov (Joachimsthal), Czech Republic. In the U.S. mine, Gold Hill, Tooele Co., Utah, USA.

Name: For the Kaatiala pegmatite, Finland, in which it was first found.

Type Material: Mineralogical-Geological Museum, University of Oslo, Oslo, Norway; The Natural History Museum, London, England.

References: (1) Raade, G., M.H. Mladeck, R. Kristiansen, and V.K. Din (1984) Kaatialaite, a new ferric arsenate mineral from Finland. Amer. Mineral., 69, 383–387. (2) Schmetzer, K. and O. Medenbach (1986) Kaatialaite from Nieder-Beerbach, Odenwald – a second occurrence. Neues Jahrb. Mineral., Monatsh., 337–342. (3) Boudjada, A. and J.C. Guitel (1981) Structure cristalline d'un orthoarséniate acide de fer(III) pentahydraté: $Fe(H_2AsO_4)_3.5H_2O$. Acta Cryst., 37, 1402–1405 (in French with English abs.).