

Crystal Data: Monoclinic. *Point Group:* 2/m. As elongated lamellar crystals, to 200 μm . Typically in parallel or divergent aggregates, forming dense chalklike masses to 3 cm.

Physical Properties: *Cleavage:* Imperfect basal. *Fracture:* n.d. *Tenacity:* Brittle.
Hardness = 1-2 D(meas.) = 2.01(1) D(calc.) = 2.001

Optical Properties: Transparent. *Color:* Colorless. *Streak:* White. *Luster:* Dull to silky.
Optical Class: Biaxial (+) [by analogy to sanjuanite]. $\alpha = 1.493(5)$ $\beta = \text{n.d.}$ $\gamma = 1.485(5)$
Pleochroism: None. *Orientation:* Z \perp to elongation, X \parallel to elongation.

Cell Data: *Space Group:* P2/a. $a = 7.073(1)$ $b = 9.634(2)$ $c = 10.827(2)$ $\beta = 100.40(1)^\circ$
Z = 2

X-ray Powder Pattern: Alyaskitovy deposit, Arangas Creek, eastern Sakha (Yakutia), Russia.
9.64 (100), 4.201 (51), 10.64 (29), 5.325 (25), 3.142 (18), 3.482 (14), 3.216 (14)

Chemistry:	(1)	(2)	(3)
Al_2O_3	25.36	26.64	25.54
P_2O_5	18.50	17.20	17.78
SO_3	20.95	19.10	20.06
F	5.22	4.58	4.76
$-\text{O}=\text{F}_2$		1.93	2.00
H_2O		34.24	33.86
Total		99.83	100.00

(1) Alyaskitovy deposit, eastern Sakha (Yakutia), Russia; average of 6 electron microprobe analyses, presence of H_2O , $(\text{SO}_4)^{2-}$, $(\text{PO}_4)^{3-}$ confirmed by IR spectroscopy. (2) Alyaskitovy deposit, eastern Sakha (Yakutia), Russia; average of 2 wet chemical analyses, H_2O by the Penfield method; corresponding to $\text{Al}_{2.08}(\text{P}_{0.97}\text{O}_4)(\text{S}_{0.95}\text{O}_4)\text{F}_{0.96}\cdot 7.48\text{H}_2\text{O}$. (3) $\text{Al}_2(\text{PO}_4)(\text{SO}_4)\text{F}\cdot 7.5\text{H}_2\text{O}$.

Occurrence: In cavities in quartz–muscovite–tourmaline–sulfide veins and adjacent rock, as a secondary mineral from near-surface oxidation and weathering of a strongly greisenized Li–F two-mica, leucogranite porphyry containing Sn and W mineralization.

Association: Phosphorscorodite, fluellite, gypsum, colquiriite, strengite, mansfieldite, sinkankasite.

Distribution: From the Alyaskitovy cassiterite-silicate-sulfide deposit, lower reaches of Arangas Creek, a tributary of the Elga River, Indigirka River basin, eastern Sakha (Yakutia), Russia.

Name: For *Arangas* Creek, located near the site from which the first specimens were collected.

Type Material: A.E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, Russia (# 4254/1).

References: (1) Gamyranin, G.N., N.V. Zayakina, and L.T. Galenchikova (2013) Arangasite, $\text{Al}_2(\text{PO}_4)(\text{SO}_4)\text{F}\cdot 7.5\text{H}_2\text{O}$, a new mineral from Alyaskitovoye deposit (Eastern Yakutia, Russia). *Zap. Ross. Mineral. Obshch.*, 142(5), 21-30 (in Russian, English abstract). *Geol. Ore Deposits*, 56(7), 560-566 (in English). (2) (2014) *Amer. Mineral.*, 99, 2150-2151 (abs. ref. 1). (3) Yakubovich, O. V., I. M. Steele, V. V. Chernyshev, N. V. Zayakina, G. N. Gamyranin, and O. V. Karimova (2014) The crystal structure of arangasite, $\text{Al}_2\text{F}(\text{PO}_4)(\text{SO}_4)\cdot 9\text{H}_2\text{O}$ determined using low-temperature synchrotron data. *Mineral. Mag.*, 78(4), 889-903.