

**Crystal Data:** Monoclinic. *Point Group:* 2/m. As elongated lamellar crystals, to 200  $\mu\text{m}$ . 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)
$\text{Al}_2\text{O}_3$	25.36	26.64	25.54
$\text{P}_2\text{O}_5$	18.50	17.20	17.78
$\text{SO}_3$	20.95	19.10	20.06
F	5.22	4.58	4.76
$-\text{O}=\text{F}_2$		1.93	2.00
$\text{H}_2\text{O}$		34.24	33.86
Total		99.83	100.00

(1) Alyaskitovy deposit, eastern Sakha (Yakutia), Russia; average of 6 electron microprobe analyses, presence of  $\text{H}_2\text{O}$ ,  $(\text{SO}_4)^{2-}$ ,  $(\text{PO}_4)^{3-}$  confirmed by IR spectroscopy. (2) Alyaskitovy deposit, eastern Sakha (Yakutia), Russia; average of 2 wet chemical analyses,  $\text{H}_2\text{O}$  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) Gamyanin, 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. Gamyanin, 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.