Gearksutite $CaAl(OH)F_4 \cdot H_2O$

Crystal Data: Monoclinic, probable. *Point Group:* n.d. As extremely minute fibers, which, under the SEM, are seen to be lath-shaped crystals; these form chalklike nodular masses and powders.

Physical Properties: Hardness = 2, in aggregates. D(meas.) = 2.72–2.768 D(calc.) = n.d. Compact, massive material fluoresces dark violet to bluish gray; powdery material fluoresces yellowish brown.

Optical Properties: Opaque; fine fibers are transparent. *Color:* White, pale rose; in transmitted light, colorless. *Luster:* Dull.
Optical Class: Biaxial (–). *Orientation:* $X = b$; $Z \wedge$ elongation = large. $\alpha = 1.448(3)$ $\beta = 1.454(3)$ $\gamma = 1.456(3)$ 2V(meas.) = Moderate.

Cell Data: *Space Group:* n.d. Z = n.d.

X-ray Powder Pattern: Ivigtut, Greenland.
4.54 (10), 3.14 (8), 2.28 (8), 1.924 (8), 3.33 (7d), 2.15 (6), 1.741 (6)

Chemistry:

	(1)	(2)	(3)
Na	0.04	0.20	
K	0.07	0.05	
Ca	22.41	22.15	22.51
Al	15.11	15.09	15.15
O	5.09	5.42	4.49
F	41.00	40.20	42.67
H_2O	15.64	15.52	15.18
insol.		0.96	
Total	99.36	99.59	100.00

(1) Wagon Wheel Gap, Colorado, USA. (2) Hot Springs, Virginia, USA. (3) $CaAl(OH)F_4 \cdot H_2O$.

Occurrence: In granite and granite pegmatites; may be formed by low-temperature hydrothermal alteration of aluminous rocks by fluorine-bearing hot springs.

Association: Cryolite, thomsenolite, sellaite, pachnolite, ralstonite, weberite, fluorite.

Distribution: Occurs in the Ivigtut cryolite deposit, southwestern Greenland. In Norway, found near Lake Gjerdingen, Nordmarka. Found at Miass, Ilmen Mountains, Southern Ural Mountains; in the Karasug barite–fluorite deposit, 15 km north of Karasug, western Tannu-Ola Mountains, Siberia; in the Zharchikhinsk molybdenum deposit, on the west side of Lake Baikal, eastern Siberia; in the Voznesensk fluorite deposit, Primorskiy Territory; and other less-well-defined localities in Russia. From Aktchatau and Baynazar, Kazakhstan. Occurs on Vulcano, Lipari Islands, Italy. At Salzburg, and near Hall, Tirol, Austria. In the USA, found between Hot Springs and Warm Springs, Bath Co., Virginia; at the Chancellor mine, Boulder Co., St. Peters Dome, near Pikes Peak, El Paso Co., and the Wagon Wheel Gap fluorite mine, Mineral Co., Colorado; in the Grand Reef mine, Graham Co., Arizona; at the Hall mine, near Tonopah, San Antone district, Nye Co., Nevada; and in the Quitman Mountains, Hudspeth Co., Texas. From Colquiri, Oruro, Bolivia. Found at the Mt. Cleveland tin mine, 14 km southwest of Waratah, Tasmania, and from Gingin, Western Australia. Several other localities are known.

Name: From the Greek *ge* for *Earth*, in allusion to the earthy appearance of the mineral, and *arksutite* (= chiolite), originally thought to be a mineral that gearksutite closely resembled in composition.

Type Material: University of Copenhagen, Copenhagen, Denmark.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 119–120. (2) Ferguson, R.B. (1949) Observations on some aluminum fluoride minerals. Amer. Mineral., 34, 383–397. (3) Ziborova, T.A., V.I. Fin'ko, I.V. Basalaeva, and N.D. Samotoin (1986) About some crystallochemical peculiarities of gearksutite. Izv. Akad. Nauk SSSR, Ser. Geol., (1986)12, 85–89 (in Russian). (4) (1988) Mineral. Abs., 39, 302 (abs. ref. 3).