Yukonite $\mathbf{Ca_7Fe^{3+}_{12}(AsO_4)_{10}(OH)_{20}\cdot 15H_2O(?)}$

Crystal Data: Amorphous, gellike to very poorly crystalline. *Point Group:* n.d. As irregular concretionary masses, typically strongly crackled.

Physical Properties: *Fracture:* Smooth to conchoidal. *Tenacity:* Extremely brittle. Hardness = 2–3 D(meas.) = 2.65; 2.86 after gas evolution. D(calc.) = n.d. May decrepitate when fresh, on exposure to air, H_2O, or warmth, with evolution of primarily CO_2.

Optical Properties: Translucent. *Color:* Dark brown, brownish black, violet to deep blood-red; in thin splinters, deep brown, yellowish brown, reddish purple. *Streak:* Brownish yellow. *Luster:* Vitreous to resinous.
Optical Class: Isotropic. n = n.d.

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

X-ray Powder Pattern: Tagish Lake, Canada.
14.1 (100), 2.79 (60), 3.25 (57), 5.58 (37), 2.61 (20), 1.63 (20), 2.24 (11)

Chemistry:	(1)	(2)	(3)		(1)	(2)	(3)
SO_3		0.12		ZnO		0.56	
P_2O_5		0.22		MgO		0.41	
As_2O_5	36.3	39.68	38.95	CaO	10.6	12.86	13.30
SiO_2		0.21		H_2O^+		[5.22]	
Fe_2O_3	36.6	30.25	32.48	H_2O^-		[10.03]	
MnO		0.44		H_2O	17.9		15.27
				Total	101.4	[100.00]	100.00

(1) Tagish Lake, Canada; by electron microprobe, total Fe as Fe_2O_3, H_2O by TGA.
(2) Rędziny, Poland; by electron microprobe, total Fe as Fe_2O_3, H_2O calculated for charge balance; corresponds to $(Ca_{6.48}Mg_{0.29}Zn_{0.19}Mn_{0.17})_{\Sigma=7.13}Fe_{10.70}[(AsO_4)_{9.75}(SiO_4)_{0.10}(PO_4)_{0.09}(SO_4)_{0.04}]_{\Sigma=9.98}(OH)_{16.37}\cdot 15.72H_2O$. (3) $Ca_7Fe_{12}(AsO_4)_{10}(OH)_{20}\cdot 15H_2O$.

Occurrence: A secondary mineral typically altered from arsenopyrite.

Association: Symplesite, argentian galena, pyrargyrite, argentite, chalcopyrite, arsenopyrite, quartz (Tagish Lake, Canada); parasymplesite, köttigite, ogdensburgite, pharmacosiderite, legrandite, willemite, franklinite, sphalerite (Sterling Hill, New Jersey, USA); arsenopyrite, arseniosiderite, arsenolite, barian pharmacosiderite (Trout Creek, Colorado, USA); arsenopyrite, pharmacosiderite (Rędziny, Poland).

Distribution: Found on the west side of Windy Arm, Tagish Lake, Yukon Territory, Canada. In the USA, from Sterling Hill, Ogdensburg, Sussex Co., New Jersey, and the Crystal No. 8 mine, Trout Creek pegmatites, Chaffee Co., Colorado. In Germany, from Saalfeld, Thuringia; at Graulai mountain, near Lammersdorf, Eifel district; from Hasserode, near Wernigerode, Harz Mountains; and at Heubachtal, Black Forest. From Rędziny, Poland.

Name: For Yukon Territory, Canada, within which the mineral was first found.

Type Material: The Natural History Museum, London, England, 1916,454; Geological Survey of Canada, Ottawa, 18594; Royal Ontario Museum, Toronto, Canada, M11468; National Museum of Natural History, Washington, D.C., USA, R5783.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 953–955 [arseniosiderite, part]. (2) Tyrrell, J.B. and R.P.D. Graham (1913) Yukonite, a new hydrous arsenate of iron and calcium, from the Tagish Lake, Yukon Territory, Canada; with a note on the associated symplesite. Trans. Roy. Soc. Canada, 7(IV), 3, 13–18. (3) Dunn, P.J. (1982) New data for pitticite and a second occurrence of yukonite at Sterling Hill, New Jersey. Mineral. Mag., 46, 261–264. (4) Pieczka, A., B. Gołębiowska, and W. Franus (1998) Yukonite, a rare Ca-Fe arsenate, from Rędziny (Sudetes, Poland). Eur. J. Mineral., 10, 1367–1370. (5) Ross, D.R. and J.E. Post (1997) New data on yukonite. Powder Diffraction, 12, 113–116.