Tritomite-(Y) $(Y, Ca, La, Fe^{2+})_5(Si, B, Al)_3(O, OH, F)_{13}(?)$

Crystal Data: Metamict; hexagonal after heating at 1000 °C. *Point Group:* n.d. As irregular grains and masses, to 2.5 cm.

Physical Properties: *Fracture:* Conchoidal. Hardness = 3.5–6.5 VHN = 515–609 D(meas.) = 3.05–3.40 D(calc.) = n.d.

Optical Properties: Translucent in thin fragments. *Color:* Greenish black, dark reddish brown to brownish black; pale green, pale olive-brown to yellowish brown in thin section. *Streak:* Greenish gray. *Luster:* Weakly vitreous to resinous. *Optical Class:* Isotropic. $n = 1.627–1.685$

Cell Data: *Space Group:* n.d. $a = 9.32$, after heating at 1000 °C. $c = 6.84$ Z = n.d.

X-ray Powder Pattern: Cranberry Lake, New Jersey, USA; after heating at 1000 °C and the appearance of an apatitelike phase.
2.78 (100), 4.02 (50), 3.13 (50), 3.83 (40), 3.05 (40), 2.76 (40), 1.930 (40)

Chemistry:

	(1)	(2)		(1)	(2)
SiO_2	24.89	24.66	PbO		0.11
TiO_2	0.27	0.23	BeO		0.23
ThO_2	1.84	2.84	MgO	0.50	0.20
UO_3		0.92	CaO	7.81	16.61
B_2O_3	10.04	11.12	SrO	0.05	
Al_2O_3	3.87	6.21	Na_2O	0.11	0.08
Y_2O_3	17.77	20.03	K_2O	0.01	
La_2O_3	0.73	5.72	F	0.44	1.02
CeO_2	2.49		Cl	0.45	
Ce_2O_3		2.85	H_2O^+	9.82	3.68
RE_2O_3	13.41		H_2O^-	1.93	
Fe_2O_3	3.22		P_2O_5	0.02	
FeO		3.47	$-O = (F, Cl)_2$	0.28	0.43
MnO	0.60	0.45	Total	99.99	[100.00]

(1) Cardiff township, Canada; spectrographic analysis of RE = Pr_6O_{11} 0.54%, Nd_2O_3 1.84%, Sm_2O_3 1.07%, Eu_2O_3 0.14%, Gd_2O_3 1.61%, Tb_4O_7 0.34%, Dy_2O_3 1.92%, Ho_2O_3 0.50%, Er_2O_3 1.99%, Tm_2O_3 0.31%, Yb_2O_3 2.88%, Lu_2O_3 0.27%. (2) Cranberry Lake, New Jersey, USA; recalculated to 100.00% after removal of calcite impurity; Y_2O_3 includes all Y group RE, La_2O_3 includes all Ce group RE.

Occurrence: In granite pegmatites and pegmatite veins cutting pyroxenite.

Association: Calcite, apatite, diopside, fluorite, scapolite (Cardiff township, Canada); albite, calcite, arfvedsonite, pyrite, quartz, tourmaline (Faraday mine, Canada); magnetite, zircon, apatite, calcite, fergusonite (Cranberry Lake, New Jersey, USA).

Distribution: In the USA, from near Cranberry Lake, Sussex Co., New Jersey. In Canada, from a prospect pit in Cardiff township, and in the Faraday mine, Bancroft district, Ontario.

Name: For its relation to *tritomite*-(Ce), and *yttrium* in the composition.

Type Material: Harvard University, Cambridge, Massachusetts, 108000; The Natural History Museum, London, England, 1963,226; Canadian Geological Survey, Ottawa, Canada, 14270.

References: (1) Frondel, C. (1961) Two yttrium minerals: spencite and rowlandite. Can. Mineral., 6, 576–581. (2) (1961) Amer. Mineral., 46, 1204 (abs. ref. 1). (3) Jaffe, H.W. and V.J. Molinski (1962) Spencite, the yttrium analogue of tritomite from Sussex County, New Jersey. Amer. Mineral., 47, 9–25. (4) Joensuu, O.I. and C.O. Ingamells (1966) Additional data on the composition of spencite. Can. Mineral., 8, 647–649. (5) Hogarth, D.D., H.R. Steacy, E.I. Semenov, E.G. Proshchenko, M.E. Kazakova, and Z.T. Kataeva (1973) New occurrences and data for spencite. Can. Mineral., 12, 66–71.