Kerimasite $Ca_3Zr_2(Fe^{3+}{}_2Si)O_{12}$

Crystal Data: Cubic. *Point Group*: $4/m\ \bar{3}\ 2/m$. As spherical grains to sharp trapezohedral {211} crystals to 180 μm.

Physical Properties: *Cleavage*: None. F*racture*: Irregular. *Tenacity*: Brittle.
D(meas.) = n.d. D(calc.) = 4.104(1) *Hardness* = ~7 VHN = 1168-1288 (25 g load).

Optical Properties: Transparent. *Color*: Light to dark brown; yellow-green in transmitted light.
Streak: n.d. *Luster*: Vitreous.
Optical Class: Isotropic to anisotropic. n = 1. 945(5)

Cell Data: *Space Group*: $Ia\bar{3}\ d$. a = 12.5512(15) Z = 8

X-ray Powder Pattern: Kerimasi volcano, Gregory rift, northern Tanzania.
2.808 (100), 3.141 (89), 2.563 (89), 1.677 (75), 4.445 (67), 1.741 (25), 1.402 (21)

Chemistry:

	(1)	(2)		(1)	(2)
Fe_2O_3	16.92	16.01	Pr_2O_3	0.10	
Al_2O_3	6.77	6.83	Nd_2O_3	0.43	0.24
SiO_2	7.32	8.37	Sm_2O_3	0.13	
ZrO_2	27.93	34.42	Gd_2O_3	0.10	
TiO_2	1.04	2.10	Dy_2O_3	0.11	
Nb_2O_5	8.78	3.00	Er_2O_3	0.06	
MgO	0.63	0.16	HfO_2	0.16	
Y_2O_3	0.71	0.30	CaO	25.86	27.31
La_2O_3	0.18	0.09	MnO	0.33	0.11
Ce_2O_3	0.64	0.31	Total	98.20	99.25

(1) Kerimasi volcano, northern Tanzania; average of 7 electron microprobe analyses supplemented by Raman spectroscopy; corresponding to $(Ca_{2.89}Mn_{0.03}Ce_{0.02}Nd_{0.02}La_{0.01}Sm_{0.01})_{\Sigma=2.98}(Zr_{1.42}Nb_{0.41}Mg_{0.10}Y_{0.04}Hf_{0.01})_{\Sigma=1.98}(Fe^{3+}{}_{1.33}Al_{0.83}Si_{0.76}Ti_{0.09})_{\Sigma=3.00}O_{12}$.
(2) Kerimasi volcano, northern Tanzania; average of 20 electron microprobe analyses supplemented by Raman spectroscopy; corresponding to $(Ca_{3.00}Mn_{0.01}Ce_{0.01}Nd_{0.01})_{\Sigma=3.03}(Zr_{1.72}Nb_{0.14}Ti_{0.08}Mg_{0.02}Y_{0.02})_{\Sigma=1.98}(Fe^{3+}{}_{1.23}Si_{0.86}Al_{0.82}Ti_{0.09})_{\Sigma=3.00}O_{12}$.

Mineral Group: Garnet supergroup, schorlomite group.

Occurrence: A magmatic phase in calcite carbonatite associated with a nephelinitic volcano (Kerimasi) and surrounding pyroclastic rocks (carbonatite agglomerates and tuffs).

Association: Calcite, rarely fluorapatite and magnesioferrite.

Distribution: From Kerimasi volcano and the Loluni, Kisete and Loolmurwak explosion craters, Gregory rift, northern Tanzania.

Name: For the *Kerimasi* volcano in Tanzania.

Type Material: Natural History Museum, London, England (BM.1995,P6(47); BM.1995,P6(22)), and the Mineralogical Museum, Department of Mineralogy, Faculty of Geology, St. Petersburg State University, St. Petersburg, Russia (1/19363).

References: (1) Zaitsev, A.N., C.T. Williams, S.N. Britvin, I.V. Kuznetsova, J. Spratt, S.V. Petrov, and J. Keller (2010) Kerimasite, $Ca_3Zr_2(Fe^{3+}{}_2Si)O_{12}$, a new garnet from carbonatites of Kerimasi volcano and surrounding explosion craters, northern Tanzania. Mineral. Mag., 74, 803-820.
(2) (2011) Amer. Mineral., 96, 1655-1656 (abs. ref. 1).