

Crystal Data: Orthorhombic, pseudohexagonal. *Point Group:* 2/m 2/m 2/m. Crystals are flat, tabular on {001}, stubby rectangular, microcrystals may show “swallow-tail” terminations, to 1 mm. *Twinning:* Always polysynthetically twinned || to [001].

Physical Properties: Hardness = n.d. D(meas.) = 2.541(2) D(calc.) = [2.42]

Optical Properties: Semitransparent. *Color:* Colorless.

Optical Class: Biaxial (-). *Orientation:* X = c, Y = a, Z = b. $\alpha = 1.511$ $\beta = 1.533$ $\gamma = 1.534$
2V(meas.) = 29°

Cell Data: *Space Group:* Pbca. a = 5.044(3) b = 8.809(7) c = 12.743(3) Z = 4

X-ray Powder Pattern: Oldoinyo Lengai volcano, Tanzania.

3.046 (vvs), 6.377 (vs), 4.385 (vs), 2.536 (vs), 2.071 (vs), 3.181 (ms), 2.161 (ms)

Chemistry:	(1)	(2)	(3)
SO ₃	2.1	1.07	
CO ₂	39.0	[39.18]	42.71
P ₂ O ₅		0.47	
CaO	22.2	26.11	27.21
SrO	2.0	2.27	
BaO	0.6	0.28	
Na ₂ O	26.2	23.56	30.08
K ₂ O	7.9	6.96	
F	0.23		
Cl	0.42	0.13	
H ₂ O	0.8		
-O = (F, Cl) ₂	0.2	0.03	
Total	101.2	[100.00]	100.00

(1) Oldoinyo Lengai volcano, Tanzania. (2) Do.; by electron microprobe, CO₂ by difference.

(3) Na₂Ca(CO₃)₂.

Polymorphism & Series: Trimorphous with natrofairchildite and zemkorite.

Occurrence: As phenocrysts in carbonate lavas, persistent due to rapid cooling.

Association: Halite, sylvite, fluorite, gregoryite, calcite.

Distribution: In Tanzania, from the Oldoinyo Lengai and Kerimasi volcanos.

Name: To honor Julius Kambarage *Nyerere* (1922-1999), President of Tanzania when the mineral was found.

Type Material: National Museum of Natural History, Washington, D.C., USA, 113544, 162608.

References: (1) (1975) Amer. Mineral., 60, 487-488 (abs. of unpublished data submitted to IMA in 1963). (2) McKie, D. and E.J. Frankis (1977) Nyerereite: a new volcanic carbonate mineral from Oldoinyo Lengai, Tanzania. Zeits. Krist., 145, 73-95. (3) (1978) Amer. Mineral., 63, 600 (abs. ref. 2). (4) Church, A. and A.P. Jones (1995) Silicate-carbonate immiscibility at Oldoinyo Lengai. J. Petrol., 36(4), 869-889. (5) Zucchini, A., P.N. Gavryushkin, A.V. Golovin, N.B. Bolotina, P. Stabile, M.R. Carroll, P. Comodi, F. Frondini, D. Morgavi, D. Perugini, F. Arzilli, M. Cherin, E. Kazimoto, K. Kokh, A. Kuznetsov, and I.V. Medrish (2022) Crystal structure of nyerereite: A possible messenger from the deep Earth. Amer. Mineral., 107, 2054-2064.