

Crystal Data: Hexagonal. *Point Group:* $\bar{3} 2/m$. Poorly developed stout hexagonal prisms, to a few tenths mm, lacking terminal faces; most material is strongly altered.

Physical Properties: Hardness = n.d. D(meas.) = 2.844 D(calc.) = 2.79

Optical Properties: Semitransparent. *Color:* Colorless.

Optical Class: Uniaxial (-). $\omega = 1.598(2)$ $\epsilon = 1.598(2)$

Cell Data: *Space Group:* $R\bar{3}m$. $a = 10.429(2)$ $c = 13.149(3)$ $Z = 6$

X-ray Powder Pattern: Mt. Shaheru, Congo.

2.657 (100), 2.607 (80), 3.304 (70), 3.722 (50), 3.354 (40), 1.861 (40), 4.380 (30)

Chemistry:	(1)	(2)	(3)		(1)	(2)	(3)
SiO ₂	49.78	50.20	50.86	Na ₂ O	16.14	20.53	17.49
TiO ₂	0.32	0.23		K ₂ O	1.18	0.27	
ZrO ₂	0.44			F	1.87		
Al ₂ O ₃	2.45	0.05		Cl	0.30	0.02	
Fe ₂ O ₃	1.86			H ₂ O ⁺	1.39		
FeO	0.54	0.35		H ₂ O ⁻	0.42		
MnO	0.58	0.17		CO ₂	0.00		
MgO	0.41	0.17		P ₂ O ₅	0.02	0.00	
CaO	22.68	27.28	31.65	SO ₃	0.19		
SrO	0.00			S		0.02	
BaO	0.09			-O = (F, Cl) ₂	0.86		
Total					99.80	99.29	100.00

(1) Mt. Shaheru, Congo. (2) Oldoinyo Lengai volcano, Tanzania; by electron microprobe.

(3) Na₂Ca₂Si₃O₉.

Occurrence: In nepheline (Mt. Shaheru, Congo); in nepheline and ash ejecta (Oldoinyo Lengai volcano, Tanzania).

Association: Götzenite (Mt. Shaheru, Congo); wollastonite, clinopyroxene, nepheline, melilite, titanian garnet, titanian magnetite (Oldoinyo Lengai, Tanzania).

Distribution: On Mt. Shaheru, the extinct southern cone of Mt. Nyiragongo, Kivu Province, Congo (Zaire). From the Oldoinyo Lengai volcano, Tanzania.

Name: To honor Arthur Delmar Combe, Geological Survey of Uganda.

Type Material: Royal Museum of Central Africa, Tervuren, Belgium, RGM8037; National Museum of Natural History, Washington, D.C., USA, 142981; The Natural History Museum, London, England, 1957,705.

References: (1) Sahama, T.G. and K. Hytönen (1957) Götzenite and combeite, two new silicates from the Belgian Congo. *Mineral. Mag.*, 31, 503–510. (2) (1958) *Amer. Mineral.*, 43, 791 (abs. ref. 1). (3) Fischer, R.X. and E. Tillmanns (1987) Revised data for combeite, Na₂Ca₂Si₃O₉. *Acta Cryst.*, C43, 1852–1854. (4) Dawson, J.B., J.V. Smith, and I.M. Steele (1989) Combeite (Na_{2.33}Ca_{1.74}others_{0.12})Si₃O₉ from Oldoinyo Lengai, Tanzania. *J. Geol.*, 97, 365–372.