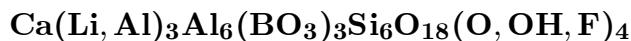


Liddicoatite



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Crystal Data: Hexagonal. *Point Group:* $3m$. Crystals stout prismatic, with curved convex trigonal outline, deeply striated $\parallel [0001]$, to 25 cm.

Physical Properties: *Cleavage:* Poor on $\{0001\}$. *Fracture:* Uneven to conchoidal. *Tenacity:* Brittle. Hardness = 7.5 D(meas.) = 3.02 D(calc.) = 3.05

Optical Properties: Transparent to translucent. *Color:* Brown, green, pink, red, blue; commonly zoned parallel to pyramid faces. *Streak:* Very light brown. *Luster:* Vitreous on fractures.

Optical Class: Uniaxial (-). *Pleochroism:* Strong; O = dark brown; E = light brown. $\omega = 1.637$ $\epsilon = 1.621$

Cell Data: *Space Group:* $R3m$. $a = 15.875(3)$ $c = 7.126(2)$ $Z = 3$

X-ray Powder Pattern: Antsirabe, Madagascar. (ICDD 30-478). 2.933 (100), 2.559 (85), 3.962 (55), 4.197 (50), 3.445 (50), 2.025 (40), 1.9054 (35)

Chemistry:

	(1)
SiO ₂	37.7
TiO ₂	0.38
B ₂ O ₃	10.89
Al ₂ O ₃	37.9
FeO	0.83
MnO	0.27
MgO	0.11
CaO	4.21
Li ₂ O	2.48
Na ₂ O	0.88
F	1.72
H ₂ O ⁺	2.69
-O = F ₂	0.72
Total	99.34

(1) Antsirabe, Madagascar; corresponds to $(\text{Ca}_{0.72}\text{Na}_{0.27})_{\Sigma=0.99}(\text{Li}_{1.59}\text{Al}_{1.13}\text{Fe}_{0.11}^{2+}\text{Ti}_{0.05}\text{Mn}_{0.04}\text{Mg}_{0.03})_{\Sigma=2.95}\text{Al}_6(\text{BO}_3)_3\text{Si}_{6.02}\text{O}_{18}[(\text{OH})_{2.86}\text{F}_{0.87}\text{O}_{0.27}]_{\Sigma=4.00}$.

Mineral Group: Tourmaline group.

Occurrence: Detrital in soil, an apparent product of the local pegmatites.

Association: Quartz, elbaite, albite, micas.

Distribution: From Antsirabe, Tsilaizina, and Anjanabonoina, Madagascar. There are probably other localities but chemical analysis is required for distinction from other tourmaline group minerals.

Name: For Richard Thomas Liddicoat, Jr. (1918–), American gemologist.

Type Material: National Museum of Natural History, Washington, D.C., USA, 135815; The Natural History Museum, London, England, 1977,59.

References: (1) Dunn, P.J., D.E. Appleman, and J.E. Nelen (1977) Liddicoatite, a new calcium end-member of the tourmaline group. *Amer. Mineral.*, 62, 1121–1124. (2) Nuber, B. and K. Schmetzer (1981) Strukturverfeinerung von Liddicoatit. *Neues Jahrb. Mineral., Monatsh.*, 215–219 (in German with English abs.). (3) Deer, W.A., R.A. Howie, and J. Zussman (1986) *Rock-forming minerals*, (2nd edition), v. 1B, disilicates and ring silicates, 559–602.

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