

Londonite

(Cs, K, Rb)Al₄Be₄(B, Be)₁₂O₂₈

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Crystal Data: Cubic. *Point Group:* $\bar{4}3m$ (by analogy to rhodizite). As portions of Cs-rich material heterogeneously distributed throughout crystals, patchy, exsolutionlike, and in veinlets; crystals may show dominant {110}, modified by {111}, {221}, {211}, rare {100}, to 7 cm.

Physical Properties: *Fracture:* Conchoidal. *Tenacity:* Brittle. Hardness = 8
D(meas.) = 3.34 D(calc.) = 3.42 [Strongly piezoelectric and pyroelectric.]

Optical Properties: Transparent to translucent. *Color:* Colorless, white, sulfur-yellow, pale yellow, pale yellow-green. *Streak:* White. *Luster:* Vitreous.
Optical Class: Isotropic. $n = 1.693$

Cell Data: *Space Group:* $P\bar{4}3m$. $a = 7.3205(3)$ $Z = 1$

X-ray Powder Pattern: Antandrokomby, Madagascar (very similar to rhodizite).
2.9898 (100), 2.1132 (70), 2.4410 (50), 1.7759 (40), 3.276 (35), 1.9568 (35), 2.2076 (30)

Chemistry:	(1)	(2)	(1)	(2)
SiO ₂	0.07	0.45	Na ₂ O	0.11
B ₂ O ₃	[47.39]	46.82	K ₂ O	2.21
Al ₂ O ₃	25.10	24.41	Rb ₂ O	1.04
Fe ₂ O ₃	0.06	0.12	Cs ₂ O	8.37
BeO	[15.49]	12.20	H ₂ O ⁺	4.10
MnO	0.05		H ₂ O ⁻	0.53
CaO	0.14			
Li ₂ O	0.04	0.00	Total	[100.07] [99.91]

(1) Antandrokomby, Madagascar; by electron microprobe, average of five analyses, B₂O₃ and BeO calculated for stoichiometry; corresponds to (Cs_{0.48}K_{0.38}Rb_{0.09}Na_{0.03}Ca_{0.02}Mn_{0.01})_{Σ=1.01}(Al_{3.98}Li_{0.02}Fe_{0.01})_{Σ=4.01}Be_{4.00}(B_{10.99}Si_{0.01}Be_{1.00})_{Σ=12.00}O_{28.00}. (2) Manjaka, Madagascar; original total given as 99.92%, neglecting impurities and H₂O, corresponds to (Cs_{0.45}K_{0.32}Rb_{0.16}Na_{0.03})_{Σ=0.96}Al_{4.08}Be_{4.00}(B_{11.48}Be_{0.15})_{Σ=11.63}O_{28.00}.

Occurrence: An uncommon component of granite pegmatites, in the central zones and in miarolitic cavities.

Association: Rhodizite, danburite, elbaite–liddicoatite–schorl, Cs-rich beryl, spodumene, Mn-rich apatite, hambergite, microlite, manganocolumbite, manganotantalite, béhierite, hafnian zircon, albite, microcline, quartz.

Distribution: In Madagascar, from Antandrokomby, near Mt. Bity, Manandona Valley, Antsirabe district; at Antsongombato and Ampanivana, south of Mahaiza, and from Manjaka, Betafo region.

Name: To honor Dr. David London (1953–), Professor of Geology and Geophysics, University of Oklahoma, Norman, Oklahoma, USA, for his contributions to the understanding of granite pegmatites.

Type Material: Museum of Natural History, Milan, Italy, M31115; Department of Geology and Geophysics, New Orleans, USA.

References: (1) Simmons, W.B., F. Pezzotta, A.U. Falster, and K.L. Webber (2001) Londonite, a new mineral species: the Cs-dominant analogue of rhodizite from the Antandrokomby granitic pegmatite, Madagascar. *Can. Mineral.*, 39, 747–755. (2) Frondel, C. and J. Ito (1965) Composition of rhodizite. *Tschermaks Mineral. Petrog. Mitt.*, 10, 409–412.