

Crystal Data: Monoclinic. *Point Group:* $2/m$ or m . As discrete subhedral grains, rarely showing {001} and {101}, heavily striated || [010], to 1 mm; as crystalline aggregates.

Physical Properties: *Cleavage:* Good on {001}, may be a parting. *Fracture:* Conchoidal. *Tenacity:* Brittle. Hardness = [6] VHN = 761–900, 824 average (10 g load). D(meas.) = n.d. D(calc.) = 5.00

Optical Properties: Translucent. *Color:* Light to dark brown, chocolate-brown, or shades of gray; brown in transmitted light; gray in reflected light, with brown internal reflections.

Streak: White. *Luster:* Resinous.

Optical Class: Biaxial. $n = > 2.0$, with very high birefringence. $2V(\text{meas.}) = \text{High}$.

Anisotropism: Weak.

R: (470) 16.6, (546) 15.6, (589) 15.3, (650) 15.0

Cell Data: *Space Group:* $C2/c$ or Cc ; structure refined in $I2/a$. $a = 5.178(1)$
 $b = 8.756(4)$ $c = 9.768(5)$ $\beta = 93.52(4)^\circ$ $Z = 4$

X-ray Powder Pattern: Argyle mine, Western Australia.

3.376 (10), 3.203 (8), 2.584 (7), 3.257 (6), 1.8306 (6), 2.225 (5), 2.541 (4)

Chemistry:

	(1)
SiO ₂	0.25
TiO ₂	47.93
Al ₂ O ₃	0.04
La ₂ O ₃	13.12
Ce ₂ O ₃	24.99
Pr ₂ O ₃	5.50
Nd ₂ O ₃	5.90
MgO	0.03
CaO	0.62
Total	98.38

(1) Argyle mine, Western Australia; by electron microprobe; after neglecting Ca, Mg, and SiO₂, and assuming minor H₂O accounting for low total, corresponds to (Ce_{0.51}La_{0.27}Pr_{0.11}Nd_{0.12})_{Σ=1.01}Ti_{2.00}(O, OH)₆.

Polymorphism & Series: Dimorphous with aeschynite-(Ce).

Occurrence: In heavy-media concentrates from non-sandy tuff in an olivine lamproite diatreme.

Association: Calcite, dolomite, talc, titanite, manganoan ilmenite, amphibole.

Distribution: In the Argyle AK1 diamond mine, east Kimberley area, Western Australia.

Name: For Hans Lucas, Australian geologist, CRA Exploration Pty. Ltd., who noted the mineral in concentrates.

Type Material: Western Australia Museum, Perth, M.75.1991; Museum Victoria, Melbourne, Australia, M38083; The Natural History Museum, London, England; National Museum of Natural History, Washington, D.C., USA, 163783.

References: (1) Nickel, E.H., I.E. Grey, and I.C. Madsen (1987) Lucasite-(Ce), CeTi₂(O, OH)₆, a new mineral from Western Australia: its description and structure. *Amer. Mineral.*, 72, 1006–1010.