$\odot$ 2001-2005 Mineral Data Publishing, version 1

**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(meas.) = High.

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:

Anisotropism: Weak.

	(1)
$SiO_2$	0.25
$TiO_2$	47.93
$Al_2O_3$	0.04
$La_2O_3$	13.12
$Ce_2O_3$	24.99
$Pr_2O_3$	5.50
$Nd_2O_3$	5.90
MgO	0.03
CaO	0.62
Total	98.38

(1)

(1) Argyle mine, Western Australia; by electron microprobe; after neglecting Ca, Mg, and SiO<sub>2</sub>, and assuming minor H<sub>2</sub>O accounting for low total, corresponds to  $(Ce_{0.51}La_{0.27}Pr_{0.11}Nd_{0.12})_{\Sigma=1.01}$ Ti<sub>2.00</sub>(O, OH)<sub>6</sub>.

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),  $CeTi_2(O, OH)_6$ , a new mineral from Western Australia: its description and structure. Amer. Mineral., 72, 1006–1010.