

**Arsenoflorencite-(Ce)****(Ce, La)Al<sub>3</sub>(AsO<sub>4</sub>, PO<sub>4</sub>)<sub>2</sub>(OH)<sub>6</sub>**

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**Crystal Data:** Hexagonal. *Point Group:*  $\bar{3} 2/m$ . As scalenohedral crystals, showing {10 $\bar{1}$ 1} and {10 $\bar{1}$ 2}, composed of misoriented domains; generally as subhedral grains, to 0.5 mm.

**Physical Properties:** *Fracture:* Conchoidal. *Tenacity:* Brittle. Hardness = n.d. VHN = 170 (10 g load). D(meas.) = 4.096 D(calc.) = 4.091

**Optical Properties:** Transparent to translucent. *Color:* Colorless, creamy white, light brown; light gray in reflected light.

*Optical Class:* Uniaxial (+).  $\omega = 1.739$   $\epsilon = 1.745$

**Cell Data:** *Space Group:* [ $R\bar{3}m$ ] [by analogy to florencite-(Ce)].  $a = 7.029$   $c = 16.517$   
Z = 3

**X-ray Powder Pattern:** Near Kimba, Australia.

2.963 (10), 3.513 (6), 1.905 (5), 2.201 (4), 1.753 (4), 2.752 (3), 1.627 (3)

**Chemistry:**

|                                |        |
|--------------------------------|--------|
|                                | (1)    |
| SO <sub>3</sub>                | 1.21   |
| P <sub>2</sub> O <sub>5</sub>  | 4.68   |
| As <sub>2</sub> O <sub>5</sub> | 27.02  |
| Al <sub>2</sub> O <sub>3</sub> | 28.75  |
| La <sub>2</sub> O <sub>3</sub> | 8.62   |
| Ce <sub>2</sub> O <sub>3</sub> | 12.97  |
| Pr <sub>2</sub> O <sub>3</sub> | 3.35   |
| Nd <sub>2</sub> O <sub>3</sub> | 2.40   |
| Sm <sub>2</sub> O <sub>3</sub> | 0.38   |
| Gd <sub>2</sub> O <sub>3</sub> | 1.38   |
| SrO                            | 1.99   |
| H <sub>2</sub> O               | 9.36   |
| Total                          | 102.11 |

(1) Near Kimba, Australia; by electron microprobe, average of three analyses, H<sub>2</sub>O calculated from (OH)<sup>-</sup> for charge balance; corresponding to (Ce, La, Pr, Sr, Nd, Gd, Sm)<sub>Σ=1.12</sub>Al<sub>3.00</sub> [(As, P, Al, S)<sub>Σ=1.00</sub>O<sub>4</sub>]<sub>2</sub>(OH)<sub>5.91</sub>. Arsenoflorencites with dominant La and Nd are known but are not fully described.

**Mineral Group:** Crandallite group.

**Occurrence:** As detrital grains in heavy mineral concentrates.

**Association:** Alunite, florencite-(Ce), quartz.

**Distribution:** In Australia, from the vicinity of Kimba, Eyre Peninsula, South Australia, and from the Northern Territory–Queensland border near the Gulf of Carpentaria.

**Name:** As the *arsenic* analog of florencite and for the dominant rare earth element, *cerium*.

**Type Material:** Museum Victoria, Melbourne, M38084, M38085; South Australian Museum, Adelaide, Australia, G14965; The Natural History Museum, London, England, 1986,481; National Museum of Natural History, Washington, D.C., USA, 163782.

**References:** (1) Nickel, E.H. and J.E. Temperly (1987) Arsenoflorencite-(Ce): a new arsenate mineral from Australia. *Mineral. Mag.*, 51, 605–609. (2) (1988) *Amer. Mineral.*, 73, 1492–1493 (abs. ref. 1).