## Florencite-(La) $(La, Ce)Al_3(PO_4)_2(OH)_6$



**Crystal Data:** Hexagonal, may be metamict. *Point Group:* $\overline{3}\ 2/m$. As pseudocubic rhombohedra, to 30 $\mu$m; as colloform crusts.

**Physical Properties:** *Cleavage:* Good on {0001}. *Fracture:* Splintery. *Tenacity:* Brittle. Hardness = ∼5 D(meas.) = 3.52(2) D(calc.) = 3.71

**Optical Properties:** Transparent to translucent. *Color:* Colorless to pale yellow; white in aggregates. *Luster:* Greasy to resinous.
*Optical Class:* Uniaxial (+). $\omega = 1.694(2)$ $\epsilon = 1.701(2)$

**Cell Data:** *Space Group:* $R\overline{3}m$. $a = 6.987(2)$ $c = 16.248(6)$ $Z = 3$

**X-ray Powder Pattern:** Shituru deposit, Congo; near florencite-(Ce) and -(Nd).
2.93 (100), 5.67 (90), 2.171 (80), 3.49 (70), 1.884 (70), 1.743 (70), 1.601 (70)

**Chemistry:**

| | (1) | (2) | | (1) | (2) |
|---|---|---|---|---|---|
| $SO_3$ | | 0.71 | $Eu_2O_3$ | | 0.18 |
| $P_2O_5$ | 29.1 | 27.74 | $Gd_2O_3$ | 0.9 | 0.51 |
| $SiO_2$ | 1.4 | | $Yb_2O_3$ | | 0.04 |
| $Al_2O_3$ | 32.0 | 32.55 | $Fe_2O_3$ | | 0.18 |
| $Y_2O_3$ | | 0.11 | MgO | 0.9 | |
| $La_2O_3$ | 19.0 | 11.86 | CaO | 0.2 | 1.33 |
| $Ce_2O_3$ | 10.5 | 0.80 | SrO | | 3.88 |
| $Pr_2O_3$ | | 4.70 | BaO | | 0.62 |
| $Nd_2O_3$ | 0.8 | 4.15 | $H_2O$ | n.d. | 10.43 |
| $Sm_2O_3$ | | 0.18 | Total | | [99.97] |

(1) Shituru deposit, Congo; by electron microprobe, corresponding to $(La_{0.61}Ce_{0.34}Gd_{0.03}Nd_{0.02})_{\Sigma=1.00}Al_3(PO_4)_2(OH)_6$. (2) Bohemia, Czech Republic; by electron microprobe, original total given as 100.00%; corresponding to $(La_{0.36}Sr_{0.18}Pr_{0.14}Nd_{0.12}Ca_{0.12}Ce_{0.02}Ba_{0.02}Gd_{0.01})_{\Sigma=1.00}(Al_{3.16}Fe_{0.01})_{\Sigma=3.17}[(PO_4)_{1.94}(SO_4)_{0.04}]_{\Sigma=1.98}(OH)_{5.99}$.

**Mineral Group:** Crandallite group.

**Occurrence:** A secondary mineral in weathered metamorphosed corrensitic siltstone (Shituru deposit, Congo); an authigenic mineral in sandstone.

**Association:** Synchysite-(Nd), manganoan siderite, sphalerite, kaolinite, "chalcedony".

**Distribution:** From the Shituru copper deposit, Likasi, Katanga Province, Congo (Shaba Province, Zaire). At the Bangombé natural fission reactor, Gabon. In the Hamr, Stráž, and Holičky deposits, Czech Republic.

**Name:** For a *florencite* with *lanthanum* as the dominant rare earth element.

**Type Material:** n.d.

**References:** (1) Lefebvre, J.-J. and C. Gasparrini (1980) Florencite, an occurrence in the Zairian Copperbelt. Can. Mineral., 18, 301–311. (2) (1984) Amer. Mineral., 69, 566 (abs. ref. 1). (3) Scharm, B., P. Kühn, M. Scharmová, and L. Novák (1985) Florencite-(La) in the uranium deposits in the Cretaceous of northern Bohemia. Časopis pro mineralogii a geologii, 30(2), 163–172.