## Laurelite $Pb_7F_{12}Cl_2$



**Crystal Data:** Hexagonal. *Point Group:* $\overline{6}$. As acicular prismatic crystals, to 1 cm, with basal terminations. As jackstraw aggregates and parallel bundles. *Twinning:* By rotation around [0001], pervasive.

**Physical Properties:** *Cleavage:* {0001}, imperfect. *Fracture:* Conchoidal. *Tenacity:* Brittle, needles are slightly flexible. Hardness = 2 D(meas.) = 7.65(5) D(calc.) = 7.77 Dissolves very slowly in cold $H_2O$.

**Optical Properties:** Transparent. *Color:* Colorless. *Streak:* White. *Luster:* Silky, subadamantine on broken surfaces.
*Optical Class:* Uniaxial (+). $\omega = 1.903(5)$ $\epsilon = 1.946(5)$

**Cell Data:** *Space Group:* $P\overline{6}$. $a = 10.267(1)$ $c = 3.9844(4)$ Z = 1

**X-ray Powder Pattern:** Grand Reef mine, Arizona, USA.
3.33 (100), 1.934 (60), 3.125 (40), 2.949 (40), 1.709 (40), 1.282 (40), 2.090 (35)

**Chemistry:**

| | (1) | (2) |
|---|---|---|
| Pb | 82.0 | 82.92 |
| F | 13.0 | 13.03 |
| Cl | 3.6 | 4.05 |
| OH | 0.9 | |
| Total | 99.5 | 100.00 |

(1) Grand Reef mine, Arizona, USA; by electron microprobe, $H_2O$ by moisture titration; corresponding to $Pb_{0.97}[F_{1.68}Cl_{0.25}(H_2O)_{0.07}]_{\Sigma=2.00}$. (2) $Pb_7F_{12}Cl_2$.

**Occurrence:** In a vug isolated from acidic sulfate-rich solutions in the oxidized zone of a low-temperature Pb–Cu–Ag deposit.

**Association:** Grandreefite, pseudograndreefite, aravaipaite, galena, fluorite, anglesite, linarite, caledonite, quartz.

**Distribution:** From the Grand Reef mine, about six km northeast of Klondyke, Aravaipa district, Graham Co., Arizona, USA.

**Name:** For Laurel Canyon, Arizona, USA, where the Grand Reef mine is located.

**Type Material:** Natural History Museum, Los Angeles, California, 33608; National Museum of Natural History, Washington, D.C., USA, 166057.

**References:** (1) Kampf, A.R., P.J. Dunn, and E.E. Foord (1989) Grandreefite, pseudograndreefite, laurelite, and aravaipaite: four new minerals from the Grand Reef mine, Graham County, Arizona. Amer. Mineral., 74, 927–933. (2) Kampf, A.R. and E.E. Foord (1996) Calcioaravaipaite, a new mineral, and associated lead fluoride minerals from the Grand Reef mine, Graham County, Arizona. Mineral. Record, 27, 293–300. (3) Merlino, S., M. Pasero, N. Perchiazzi, and A.R. Kampf (1996) Laurelite: its crystal structure and relationship to $\alpha-PbF_2$. Amer. Mineral., 81, 1277–1281.