

Crystal Data: Monoclinic. *Point Group:* *m*. As radiating tabular acicular crystals, elongated along [001], to 5 mm; dominant forms include {100}, {1 $\bar{3}$ 0}, {130}, {1 $\bar{3}$ 1}, {131}; aggregates may resemble cotton-balls, or in matted coatings and crusts.

Physical Properties: *Cleavage:* Perfect, two directions yielding traces parallel [100] and [001] on {100}. Hardness = n.d. D(meas.) = 1.805 D(calc.) = 1.806

Optical Properties: Translucent. *Color:* White. *Streak:* White. *Luster:* Silky. *Optical Class:* Biaxial (-). *Orientation:* Z = b; Y \wedge c = 11°. α = 1.462 β = 1.482 γ = 1.490 2V(meas.) = 65°

Cell Data: *Space Group:* Cc. a = 8.553(6) b = 36.957(18) c = 7.155(8) β = 97.93(9)° Z = 12

X-ray Powder Pattern: Sapucaia mine, Brazil; nearly identical to bearsite. 7.00 (10), 3.278 (9), 4.24 (6), 3.023 (6), 2.819 (6), 6.15 (4), 2.325 (4)

| Chemistry: | (1) | (2) |
|--------------------------------|--------|--------|
| P ₂ O ₅ | 34.76 | 35.12 |
| Al ₂ O ₃ | 0.00 | |
| Fe ₂ O ₃ | 0.11 | |
| BeO | 25.28 | 24.76 |
| H ₂ O | 39.80 | 40.12 |
| insol. | 0.30 | |
| Total | 100.25 | 100.00 |

(1) Sapucaia mine, Brazil; iron impurity as hematite; corresponds to Be_{2.04}(P_{0.99}O₄)(OH)·3.98H₂O. (2) Be₂(PO₄)(OH)·4H₂O.

Occurrence: A rare late-stage hydrothermal mineral in complex zoned granite pegmatites.

Association: Beryl, beryllonite, hydroxylherderite, frondelite, triphylite, apatite, muscovite.

Distribution: In Brazil, from the Sapucaia pegmatite mine, about 50 km east-southeast of Governador Valadares; at the Mulundu and Humaita pegmatites, along the Jequitinhonha River, Itinga, and from the Almerindo pegmatite, Linópolis, Minas Gerais. At the Palermo #1 mine, near North Groton, Grafton Co., New Hampshire; from Greenwood, in the Dunton quarry, Newry, and at Mt. Mica, near Paris, Oxford Co., Maine, USA. In the Viitaniemi pegmatite, near Eräjärvi, Finland. At Arnac-la-Poste, Haute-Vienne, France. From Bojeveskoje, Middle Ural Mountains, Russia. In the Londonderry quarry, 19 km south of Coolgardie, Western Australia.

Name: Honors Dr. Luciano Jacques de Moraes (1896–1968), Brazilian mineralogist and geologist.

Type Material: National Musuem, Rio de Janeiro, Brazil; National School of Mines, Paris, France; National Museum of Natural History, Washington, D.C., USA, 106577.

References: (1) Lindberg, M.L., W.T. Pecora, and A.L. de M. Barbosa (1953) Moraesite, a new hydrous beryllium phosphate from Minas Gerais, Brazil. *Amer. Mineral.*, 38, 1126–1133. (2) Merlino, S. and M. Pasero (1992) Crystal chemistry of beryllophosphates: the crystal structure of moraesite, Be₂(PO₄)(OH)·4H₂O. *Zeits. Krist.*, 201, 253–262.