

**Crystal Data:** Cubic. *Point Group:*  $4/m\bar{3}2/m$ . Crystals rare, cubic, to 15 cm, may show {111}, {hll}, {hkl}; commonly granular, massive.

**Physical Properties:** *Cleavage:* {001}, perfect. *Tenacity:* Brittle. Hardness = 2–2.5  
D(meas.) = 2.79 D(calc.) = 2.808 Soluble in H<sub>2</sub>O; dark red to orange and yellow fluorescence under SW and LW UV.

**Optical Properties:** Transparent. *Color:* Carmine-red, lavender-pink to light orange.  
*Streak:* White. *Luster:* Vitreous.  
*Optical Class:* Isotropic; weak anomalous anisotropism, then uniaxial (-). *Pleochroism:* Strong; E = yellow; O = pink to deep carmine.  $n = 1.327\text{--}1.328$

**Cell Data:** *Space Group:*  $Fm\bar{3}m$  (synthetic).  $a = 4.6342$   $Z = 4$

**X-ray Powder Pattern:** Synthetic.  
2.319 (100), 1.639 (60), 1.338 (17), 1.0363 (12), 0.9458 (8), 1.1588 (7), 2.680 (3)

Chemistry:	(1)	(2)	(3)
Na	53.4	53.83	54.75
K	trace	0.32	
Mg	trace		
Ca	1.2		
ZrO <sub>2</sub>	1.5		
F	44.2	45.28	45.25
insol.		0.84	
Total	100.3	100.27	100.00

(1) Los Islands, Guinea. (2) Lovozero massif, Russia. (3) NaF.

**Occurrence:** In nepheline syenite and nepheline syenite pegmatites; in lake-bed deposits.

**Association:** Aegirine, sodalite, nepheline, neptunite, lamprophyllite, pectolite, serandite, eudialyte, ussingite, chkalovite, zeolites.

**Distribution:** On Rouma Isle, Los Islands, Guinea. On Mts. Karnasurt and Alluaiv, Lovozero massif, and from the Khibiny massif, Kola Peninsula, Russia. At Kvanefjeld, Ilímaussaq intrusion, Greenland. From Aris, about 20 km south of Windhoek, Namibia. At Lake Magadi, Kenya. From Poços de Caldas, Minas Gerais, Brazil. In the USA, at Point of Rocks, Colfax Co., New Mexico, and on Porphyry Mountain, Jamestown district, Boulder Co., Colorado. Large crystals from Mont Saint-Hilaire, Quebec, Canada.

**Name:** Honors Maxime Villiaume, French explorer, in whose collections of rocks from Guinea the mineral was first found.

**Type Material:** n.d.

**References:** (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 10. (2) Stormer, J.C, Jr., and I.S.E. Carmichael (1970) Villiaumite and the occurrence of fluoride minerals in igneous rocks. Amer. Mineral., 55, 126–134. (3) (1953) NBS Circ. 539, 1, 63.