

Crystal Data: Tetragonal. *Point Group:* $4/m\ 2/m\ 2/m$. As alteration rims on other lead minerals, and as crusts.

Physical Properties: *Cleavage:* {110}. Hardness = 2 $D(\text{meas.}) = 9.14$ (synthetic). $D(\text{calc.}) = [9.35]$

Optical Properties: Transparent. *Color:* Red; red to red-orange in transmitted light. *Luster:* Greasy to dull. *Optical Class:* Uniaxial (-). $\omega = 2.665$ (Li). $\epsilon = 2.535$ (Li).

Cell Data: *Space Group:* $P4/nmm$ (synthetic). $a = 3.9729$ $c = 5.0217$ $Z = 2$

X-ray Powder Pattern: Synthetic.
3.115 (100), 2.809 (62), 1.872 (37), 1.675 (24), 2.510 (18), 1.542 (11), 1.988 (8)

Chemistry: Analyses of natural material are not available.

Occurrence: As an alteration product of other lead-bearing minerals.

Association: Lead, galena, massicot, plattnerite, hydrocerussite.

Distribution: In the USA, from Cucamonga Peak, San Bernardino Co., California, and from near Hailey, Mineral Hill district, Blaine Co., Idaho. In the Ilímaussaq intrusion, Greenland. At Mežica (Mies), Slovenia. From Laurium, Greece, in slag. At Långban, Värmland, Sweden. In Germany, from Urberg, St. Blasien, and Badenweiler, Black Forest. Probably more common than indicated here.

Name: From the Greek word given by Dioscorides to the lead oxide obtained in parting lead from silver by fire metallurgy; a name long applied to the synthetic product.

References: (1) Palache, C., H. Berman, and C. Frondel (1944) Dana's system of mineralogy, (7th edition), v. I, 514–515. (2) Leciejewicz, J. (1961) On the crystal structure of tetragonal (red) PbO. *Acta Cryst.*, 14, 1304. (3) (1953) *NBS Circ.* 539, 2, 30.