Ganomalite $Pb_9Ca_5Mn^{2+}Si_9O_{33}$

Crystal Data: Hexagonal. *Point Group:* 3. As simple hexagonal prisms, tabular on {0001}, typically in subparallel groupings.

Physical Properties: *Cleavage:* $\{10\bar{1}0\}$ and {0001}, distinct. *Fracture:* Uneven. *Tenacity:* Very brittle. Hardness = 3 D(meas.) = 5.7 D(calc.) = [5.69]

Optical Properties: Semitransparent. *Color:* Colorless to gray. *Luster:* Resinous to vitreous.
Optical Class: Uniaxial (+). $\omega = 1.910$ $\epsilon = 1.945$

Cell Data: *Space Group:* $P3$. $a = 9.82$ $c = 10.13$ Z = 1

X-ray Powder Pattern: Jakobsberg, Sweden.
3.06 (10), 3.53 (9), 3.38 (8), 2.71 (8), 4.92 (7), 4.43 (7), 1.985 (7)

Chemistry:

	(1)	(2)	(3)
SiO_2	19.8	19.7	18.64
MnO	2.1	2.3	2.44
PbO	66.5	67.4	69.25
CaO	11.5	10.9	9.67
Total	99.9	100.3	100.00

(1) Franklin, New Jersey, USA; by electron microprobe. (2) Jakobsberg, Sweden; by electron microprobe. (3) $Pb_9Ca_5MnSi_9O_{33}$.

Occurrence: In skarn assemblages (Jakobsberg, Sweden); in manganese ores in a metamorphosed stratiform zinc orebody (Franklin, New Jersey, USA).

Association: Tephroite, lead, jacobsite, calcite, phlogopite, macedonite (Jakobsberg, Sweden); clinohedrite, willemite, andradite, franklinite (Franklin, New Jersey, USA).

Distribution: At Långban, in the Harstigen mine, near Persberg, and at Jakobsberg, Värmland, Sweden. From Franklin, Sussex Co., New Jersey, USA.

Name: From the Greek for *luster*, in allusion to its appearance.

References: (1) Dana, E.S. (1892) Dana's system of mineralogy, (6th edition), 422. (2) Dunn, P.J. (1979) Ganomalite from Franklin, New Jersey. Mineral. Record, 10, 47–48. (3) Dunn, P.J., D.R. Peacor, J.W. Valley, and C.A. Randall (1985) Ganomalite from Franklin, New Jersey, and Jakobsberg, Sweden: new chemical and crystallographic data. Mineral. Mag., 49, 579–592. (4) (1987) Amer. Mineral., 72, 1028 (abs. ref. 3). (5) Dunn, P.J. (1985) The lead silicates from Franklin, New Jersey: occurrence and composition. Mineral. Mag., 49, 721–727. (6) Welin, E. (1968) X-ray powder data for minerals from Långban and the related mineral deposits of Central Sweden. Arkiv Mineral. Geol., 4(30), 499–541.