LARSENITE AND CALCIUM-LARSENITE, NEW MEMBERS OF THE CHRYSOLITE GROUP, FROM FRANKLIN, NEW JERSEY. (Preliminary notice)

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The two minerals here to be described were found on the picking table at Franklin by W. H. Ball from whom a considerable supply was secured for the Harvard Mineralogical Museum. The material consists of large blocks of massive ore cut by narrow veins, open in part, and filled or lined by a complex of minerals, including clinohedrite, hodgkinsonite, willemite, roeblingite, hardystonite, garnet, zincite, calcite, bementite, and neotocite. Larsenite is in slender prismatic crystals, the last crystallization in a few cavities; the more abundant calcium-larsenite is for the most part massive, in the walls of the veins or replacing hardystonite in the ore, but is also found imperfectly crystallized in veins. Detailed description of all these minerals will be prepared for later publication. Here it is intended to present briefly the characters of the new mineral.

Larsenite is a lead-zinc orthosilicate with the formula Pb Zn SiO_4 and with crystallographic and optical properties which ally it to the chrysolite group of minerals. The name proposed is in honor of Professor E. S. Larsen of Harvard University.

Calcium-larsenite may be represented by the formula (Pb, Ca) Zn SiO_4, about one-half of the lead of larsenite being replaced by calcium. Its properties are closely allied to those of larsenite.

Larsenite is orthorhombic, generally in slender striated prisms but in a few crystals tabular parallel to *b* (010). The principal forms on the crystals are (010), (012), (110), (142), and (9.8.18); other forms observed are (100), (012), (122), (132), (101), (111), (131). It will be noted that the important pyramids both have complex indices, a fact for which we have no explanation. The form (9.8.18) is very close to the position of (112) but is consistent in its deviation from the simpler form.

The following table shows the rather close relationship of larsenite to the chrysolite group.

	LARSENITE	CHRYSOLITE	TEPHROITE
p_0	1.2268	1.2591	1.2911
q_0	0.5324	0.5865	0.5939
ϕ for prism (120)	49°01′	47°01′	47°23′

Details of crystallographic measurement and calculation will be presented in the later paper.

Larsenite is white and transparent with adamantine lustre. Cleavage is good parallel to the prism (120). Specific gravity 5.90. Biaxial negative, $2V$ about 80°, $\rho > \nu$ easily perceptible. Plane of optical axes across the elongation with an optic axis practically normal to the cleavage (120). Therefore $Y = c$, $X = a$.

$$\alpha = 1.92, \quad \beta = 1.95 \quad \gamma = 1.96, \quad \text{all} \pm .01. \quad \text{(Immersion)}.$$

Calcium-larsenite is white and opaque with greasy lustre. No distinct crystals have been found and cleavage is indistinct. Specific gravity 4.421. Under the iron-arc spark it shows a very strong fluorescence of a lemon yellow color, more vivid than that of willemite and easily distinguished from it. The analysis sample is biaxial negative, almost uniaxial, $2V = 5°$.

$$\alpha = 1.760, \beta = \gamma 1.769, \text{ all } \pm .001$$

A second sample, looking somewhat fresher than the analyzed material, gave $\alpha = 1.762$, $\beta = 1.770$, $\gamma = 1.774$, $2V = 40°$.

The chemical analyses by Bauer are shown below together with the derived formulae.

ANALYSIS OF LARSENITE

	I	II	III	IV	V	VI
SiO_2	16.87	.281	2.58	15.84	.2641	16.47
PbO	56.66	.254		62.82	.2817	61.20
ZnO	22.74	.279	3.50	21.34	.2621	22.23
FeO	0.10	.001				
MnO	0.14	.002				
CaO	2.42	.043	2.42			
MgO	0.20	.005				
H_2O	0.76	.042	0.76			
Total	99.89		9.26	100.00		100.00

I. Analysis—Larsenite with Clinohedrite impurity.

II. Molecular ratio.

III. Clinohedrite composition using all CaO and H_2O.

IV. Larsenite—remainder after deducting clinohedrite and apparently unessential oxides and reducing to 100%.

V. Molecular ratio.

VI. Larsenite—calculated composition of $PbO \cdot ZnO \cdot SiO_2$.

ANALYSIS OF CALCIUM-LARSENITE

	I	II		III
SiO_2	24.10	.4017		24.17
FeO	0.48			
MnO	0.57			
CaO	16.36	.293		
ZnO	30.61	.378	.795	75.83
PbO	27.63	.124		
MgO	0.23			
$H_2O+110°C$	0.12			
	100.10			

I. Analysis—Calcium-larsenite.
II. Molecular ratio.
III. Calculated composition for Mol. wt. of RO=94 or (PbO+CaO):ZnO:SiO_2 1:1:1.