Lithidionite $KNaCuSi_4O_{10}$

Crystal Data: Triclinic. *Point Group:* $\bar{1}$. As tiny plates lining cavities in the glassy crust of lapilli.

Physical Properties: Hardness = 5–6 D(meas.) = 2.75 D(calc.) = 2.85

Optical Properties: Semitransparent. *Color:* Blue.
Optical Class: Biaxial. $\alpha = 1.548$ $\beta = 1.574$ γ = n.d. 2V(meas.) = 56°

Cell Data: *Space Group:* $P\bar{1}$. $a = 9.80(1)$ $b = 8.01(1)$ $c = 6.97(1)$ $\alpha = 114.12(8)°$ $\beta = 99.52(6)°$ $\gamma = 105.59(8)°$ Z = 2

X-ray Powder Pattern: Vesuvius, Italy.
3.372 (100), 2.409 (85), 3.223 (75), 2.675 (37), 6.75 (35), 3.652 (18), 2.835 (18)

Chemistry:

	(1)	(2)	(3)
SiO_2	71.57	69.36	60.39
Fe_2O_3		0.94	
FeO	4.02		
CuO	6.49	13.29	19.99
PbO		0.73	
CaO		3.25	
Na_2O	6.78	5.10	7.79
K_2O	10.92	5.82	11.83
Total	99.78	99.49	100.00

(1) Vesuvius, Italy; average of two analyses of undoubtedly contaminated samples. (2) Do.; considered to contain tridymite ~40%. (3) $KNaCuSi_4O_{10}$.

Occurrence: In lapilli strongly modified by fumerolic action subsequent to the 1873 eruption of Vesuvius.

Association: Tridymite, wollastonite, glass.

Distribution: Found in the crater of Vesuvius, Campania, Italy.

Name: From the Greek for *pebble*, [Greek diminutive of *lithos*, for *stone*; *lithidion* in English, *litidion* in Italian] presumably for the size and shape of the lapilli on which the mineral occurs.

Type Material: Natural History Museum, Paris, France, 99.788.

References: (1) Dana, E.S. (1892) Dana's system of mineralogy, (6th edition), 1041 [lithidionite]. (2) Zambonini, F. (1935) Mineralogia Vesuviana, (2nd edition), Stab. Industrie Editoriali Meridionali, Naples, 435–439 [litidionite] (in Italian). (3) Pozas, J.M.M., G. Rossi, and V. Tazzoli (1975) Re-examination and crystal structure analysis of litidionite. Amer. Mineral., 60, 471–474. (4) Kawamura, K. and J.T. Iiyama (1981) Crystallochemistry and thermochemistry of sodipotassic copper silicate $Na_{2-2x}K_{2x}CuSi_4O_{10}$. Bull. Minéral., 104, 387–395.