Liottite $(Ca, Na, K)_8(Si, Al)_{12}O_{24}[(SO_4), Cl, (CO_3), OH]_4 \cdot H_2O$

Crystal Data: Hexagonal. *Point Group:* $\bar{6}m2$. As short prismatic crystals with pyramidal and pinacoidal terminations, up to 1 cm.

Physical Properties: Hardness = 5 D(meas.) = 2.56(2) D(calc.) = 2.61

Optical Properties: Transparent. *Color:* Colorless.
Optical Class: Uniaxial (–). $\omega = 1.530$ $\epsilon = 1.528$

Cell Data: *Space Group:* $P\bar{6}m2$. a = 12.842(3) c = 16.091(5) Z = 6

X-ray Powder Pattern: Pitigliano, Italy.
3.715 (100), 3.315 (75), 4.84 (36), 2.141 (24), 2.686 (10), 2.471 (10), 1.801 (10)

Chemistry:

	(1)
SiO_2	30.51
Al_2O_3	24.92
Fe_2O_3	0.36
CaO	16.71
Na_2O	7.97
K_2O	4.98
Cl	2.57
H_2O	1.8
CO_2	2.1
SO_3	8.66
$-O = Cl_2$	0.58
Total	100.00

(1) Pitigliano, Italy; by AA and XRF, corresponds to $(Ca_{3.59}Na_{3.10}K_{1.27}Fe^{3+}_{0.05})_{\Sigma=8.01}(Si_{6.11}Al_{5.89})_{\Sigma=12.00}O_{24}[(SO_4)_{1.30}Cl_{0.87}(CO_3)_{0.57}(OH)_{1.19}]_{\Sigma=3.93} \cdot 0.61H_2O$.

Mineral Group: Cancrinite group.

Occurrence: In cavities in ejecta blocks of metasomatized carbonate rocks in a pumice deposit.

Association: Melilite, latiumite, clintonite, anorthite, vesuvianite, grossular, andradite, pyroxene.

Distribution: At Pitigliano, near Grosseto, Tuscany, Italy.

Name: For mineral collector Luciano Liotti, who donated the specimen in which this mineral was first found.

Type Material: University of Pisa, Pisa, 3209; University of Modena, Modena, Italy.

References: (1) Merlino, S. and P. Orlandi (1977) Liottite, a new mineral in the cancrinite–davyne group. Amer. Mineral., 62, 321–326.