

**Crystal Data:** Triclinic. *Point Group:*  $\bar{1}$ . As bladed crystals, in thin veinlets and patches, to 2 mm.  
*Twinning:* Polysynthetic.

**Physical Properties:** Hardness = n.d. D(meas.) = n.d. D(calc.) = 2.975

**Optical Properties:** Transparent. *Color:* Colorless.

*Optical Class:* Biaxial (-).  $\alpha = 1.655$   $\beta = 1.661$  (synthetic)  $\gamma = 1.664$   $2V(\text{meas.}) = > 70^\circ$

**Cell Data:** *Space Group:*  $P\bar{1}$ .  $a = 6.815$   $b = 6.934$   $c = 12.882$   $\alpha = 90.67^\circ$   $\beta = 97.70^\circ$   
 $\gamma = 98.14^\circ$   $Z = 2$

**X-ray Powder Pattern:** Akagane mine, Kitakami Mountains, northeast Japan.  
2.82 (100), 3.07 (53), 2.55 (51), 2.86 (44), 2.99 (38), 2.29 (38), 2.89 (34)

Chemistry:	(1)	(2)	(3)	(4)	(5)
SiO <sub>2</sub>	33.7	33.52	33.26	32.67	33.71
CaO	62.4	61.93	61.64	60.82	62.92
Other		0.26	0.17	0.07	
Cl	0.2	0.05	1.40	5.22	
F		0.28	0.18	trace	
H <sub>2</sub> O	[3.7]	3.19	2.87	1.94	3.37
- O = (F+Cl) <sub>2</sub>		0.13	0.39	1.18	
Total	100.00	99.10	99.13	99.54	100.00

(1) Akagane mine, Kitakami Mountains, northeast Japan; average of 7 electron microprobe analyses, H<sub>2</sub>O calculated; corresponds to Ca<sub>5.93</sub>Si<sub>2.99</sub>O<sub>10.82</sub>(OH)<sub>2.19</sub>Cl<sub>0.03</sub>. (2) Birkhin gabbro massif, Eastern Siberia, Russia; average of 14 electron microprobe analyses supplemented by Raman spectroscopy. (3) Do., average of 23 electron microprobe analyses supplemented by Raman spectroscopy; corresponds to [Ca<sub>5.975</sub>Mg<sub>0.008</sub>Fe<sup>2+</sup><sub>0.004</sub>Mn<sup>2+</sup><sub>0.003</sub>]<sub>Σ=5.990</sub>[Si<sub>3.009</sub>Ti<sup>4+</sup><sub>0.001</sub>]<sub>Σ=3.010</sub>O<sub>11.266</sub>(OH)<sub>1.734</sub>Cl<sub>0.215</sub>F<sub>0.051</sub>. (4) Do., average of 11 electron microprobe analyses supplemented by Raman spectroscopy. (5) Ca<sub>6</sub>(Si<sub>2</sub>O<sub>7</sub>)(SiO<sub>4</sub>)(OH)<sub>2</sub>.

**Occurrence:** In late-stage, fracture-controlled replacement veins cutting thermally metamorphosed limestones (Scotland). A late-stage hydration product of pre-existing skarn minerals in a silica-deficient environment (Japan).

**Association:** Calcite, spurrite, kilchoanite, foshagite, tilleyite (Scotland); bicchulite, vesuvianite, calcite, clintonite, magnetite, sphalerite (Japan); hillebrandite, foshagite, defernite (Turkey); pavlovskyite, merwinite, larnite (Russia).

**Distribution:** From near Kilchoan, Ardnamurchan, Argyllshire, Scotland; from the Akagane mine, Kitakami Mountains, Iwate Prefecture, Honshu island, Japan. From the Rize region, Eastern Pontides Turkey; in the Birkhin gabbro massif, Eastern Siberia, Russia.

**Name:** To honor Della Martin Roy (b. 1926), Pennsylvania State University, University Park, Pennsylvania, USA.

**Type Material:** National Museum of Natural History, Washington, D.C., USA (119426).

**References:** (1) Agrell, S.O. (1965) Polythermal metamorphism of limestones at Kilchoan, Ardnamurchan. *Mineral. Mag.*, 34, 1-15. (2) (1965) *Amer. Mineral.*, 50, 2104-2105 (abs. ref. 1) (3) Shimazaki, H., R. Miyawaki, K. Yokoyama, S. Matsubara, and M. Bunno (2008) Occurrence and new data of dellaite from the Akagane mine, Japan. *J. Mineral. Petrol. Sci.*, 103, 385-389. (4) (2009) *Amer. Mineral.*, 94(4), 1082-1083 (abs. ref. 3). (5) Armbruster, T., B. Lazic, F. Gfeller, E. V. Galuskin, I. O. Galuskina, V. B. Savelyeva, A. E. Zadov, N. N. Pertsev, and P. Dzierzanowski (2011) Chlorine content and crystal chemistry of dellaite from the Birkhin gabbro massif, Eastern Siberia, Russia. *Mineral. Mag.*, 75(2), 379-394.