

**Crystal Data:** Monoclinic. *Point Group:* 2/m. Crystals display {010}, {100}, {001}, {110}, {011}, and {101} to 0.3 mm. *Twinning:* Simple and polysynthetic on (010).

**Physical Properties:** *Cleavage:* Good on {010}. *Fracture:* n.d. *Tenacity:* n.d. Hardness = 6.5 VHN = 366 (50 g load). D(meas.) = n.d. D(calc.) = 2.918; 2.921

**Optical Properties:** Transparent. *Color:* Colorless; white aggregates. *Streak:* White. *Luster:* Vitreous.

*Optical Class:* Biaxial (+).  $\alpha = 1.621(2)$   $\beta = 1.625(2)$   $\gamma = 1.631(2)$   $2V(\text{meas.}) = 80(5)^\circ$   $2V(\text{calc.}) = 78.7^\circ$  *Dispersion:*  $r > v$ , medium. *Orientation:*  $Z = a$ ,  $X \wedge c = 12(2)^\circ$

**Cell Data:** *Space Group:*  $P2_1/b$ .  $a = 5.06870(10)$   $b = 11.35790(10)$   $c = 15.4004(2)$   $\alpha = 100.5980(10)^\circ$   $Z = 2$

**X-ray Powder Pattern:** Calculated pattern.

3.03 (100), 2.82 (79), 2.76 (65), 2.62 (55), 1.91 (53), 3.81 (42), 1.89 (36)

|                   |        |
|-------------------|--------|
| <b>Chemistry:</b> | (1)    |
| SiO <sub>2</sub>  | 31.10  |
| CaO               | 65.27  |
| F                 | 3.64   |
| - O = F           | 1.53   |
| H <sub>2</sub> O  | 0.60   |
| Total             | 100.61 |

(1) Upper Chegem caldera, Kabardino-Balkaria, Northern Caucasus, Russia; electron microprobe analysis, supplemented by IR and Raman spectroscopy H<sub>2</sub>O calculated for charge balance; corresponds to Ca<sub>8.998</sub>(SiO<sub>4</sub>)<sub>4.002</sub>[F<sub>1.481</sub>(OH)<sub>0.518</sub>]<sub>Σ=1.999</sub>.

**Polymorphism & Series:** Forms a series with hydroxyledgrewite.

**Mineral Group:** Calcium Humite group.

**Occurrence:** In xenoliths of carbonate-silicate rock altered to sanidinite facies metamorphic rock within ignimbrites.

**Association:** Bultfonteinite, hillebrandite, jennite, chegemite, larnite, rondorfite, hydroxyllestadite.

**Distribution:** From the Upper Chegem caldera, Kabardino-Balkaria, Northern Caucasus, Russia.

**Name:** Honors Edward S. Grew (b. 1944), professor of mineralogy and petrology at the University of Maine, Orono, Maine, USA.

**Type Material:** Museum of Natural History, Bern, Switzerland (41086) and in the A.E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, Russia (4162/1).

**References:** (1) Galuskin, E.V., B. Lazic, T. Armbruster, I.O. Galuskina, N.N. Pertsev, V.M. Gazeev, R. Włodyka, M. Dulski, P. Dzierzanowski, A.E. Zadov, and L.S. Dubrovinsky (2012) Edgrewite Ca<sub>9</sub>(SiO<sub>4</sub>)<sub>4</sub>F<sub>2</sub>-hydroxyledgrewite Ca<sub>9</sub>(SiO<sub>4</sub>)<sub>4</sub>(OH)<sub>2</sub>, a new series of calcium humite-group minerals from altered xenoliths in the ignimbrite of Upper Chegem caldera, Northern Caucasus, Kabardino-Balkaria, Russia. *Amer. Mineral.*, 97, 1998-2006.