# MICROMOUNTERS OF NEW ENGLAND
# *NEWSLETTER*

*The MMNE was organized on November 8, 1966 for the purpose of promoting the study of minerals that require a microscope*

No. 284 November, 2007

## Notes from the October 2007 MMNE meeting.

The October 2007 meeting of the Micromounters of New England was held on Saturday, October 20, at the Trinity Lutheran Church, Chelmsford, MA. Only eight members were in attendance. With absences including president Mike Swanson and secretary Bob Wilken, only a brief business meeting was conducted by vice president Joe Mulvey. No meeting minutes were recorded.

## DUES REMINDER NOTE:

Dues for the year 2008 are coming up. Please make payment to the treasurer:
Anna Wilken, 79 Meadow Lane, Campton NH 03223 - **no later than December 31st.**

**Please send any change to your address, phone# or e-mail along with your dues.**

Dues for single membership $ 12 and for family $ 15.

The ***Newsletter*** is the official publication of the Micromounters of New England (MMNE). The last by-laws revision was April 19, 2003. The MMNE is a member of the Eastern Federation of Mineralogical and Lapidary Societies (EFMLS) (http://www.amfed.org/efmls) and the American Federation of Mineralogical Societies (AFMS) (http://www.amfed.org). Material from the *Newsletter* may be copied in other rock and mineral publications if credit is given to the author and the *Newsletter* and permission has been obtained from the author. If there are questions regarding copying contact the editor. The club address is c/o the Secretary. Meetings are held monthly, September through May, except for December, and usually on an informal basis in July. Meeting sites may change and will be posted in the *Newsletter* as far in advance as possible. Visitors are welcome to attend all meetings. Bring a microscope and light source if you have one.
DUES are $12/year for a single person and $15/year for a family membership, levied on a calendar basis. The family membership includes two adults and all children under 18 living at the same address. One copy of the *Newsletter* will be sent on a family membership.

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**Current Meeting**
Saturday, November 17th
Trinity Lutheran Church
Chelmsford, MA
Doors open at 9 am

Map and driving
directions are on page 8

**Next Meeting**
January 2008

For information regarding
**MEETING CANCELLATION**
due to inclement weather,
contact:
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# Kamphaugite-(Y) from Ashland, MA

*Etienne Médard, Peter Cristofono, William A Henderson Jr*

The Aggregates Industries Quarry in Ashland (Middlesex Co., Massachusetts), formerly known as the Bayer and Mingola Quarry, then the Trimount quarry, has been producing a fair amount of nice micro- to cabinet-size mineral specimens since its opening in 1948. The quarry is opened in amphibolites and gneisses crosscut by younger dikes of two-micas leucogranite. Mineralization occurs in seams or veins related to hydrothermal alteration akin to the well known European "alpine clefts". At Ashland, Jim Cahoon reported actinolite, albite, aurichalcite, biotite, bornite, calcite, chabazite, chlorite, chrysocolla, clinozoisite, epidote, fluorapatite, hematite, heulandite, hornblende, ilmenite, laumontite, magnetite, malachite, montmorillonite, muscovite, natrolite, opal, orthoclase, pickeringite, prehnite, pyrite, pyrolusite, augite, pyrrhotite, quartz, stilbite, titanite and tremolite. Babingtonite and sphalerite have also been found there.

*Fig. 1. Tan-colored spherulitic aggregates of kamphaugite-(Y) from Ashland. P. Cristofono*

Tan-colored spherules up to 1.0 mm in diameter were spotted by an unknown collector during a Boston Mineral Club fieldtrip in October 2006, and collected by Lynn Bannon and one of us (PC). The spherules were sprinkled over flat surfaces corresponding to fracture planes, and were associated with white laumontite crystals, tiny colorless stilbite crystals and white calcite masses (Fig. 1, 2). The host rock is a two-micas leucogranite. Broken spheres show a layered structure, with usually a central, compact, colorless core, then a darker beige to orange-colored band, and an external shell of radiating crystals, visible at high magnification (Fig. 3). The external shell is lightly tan-colored; in some of the smaller spherules the color even turns light cream to white.

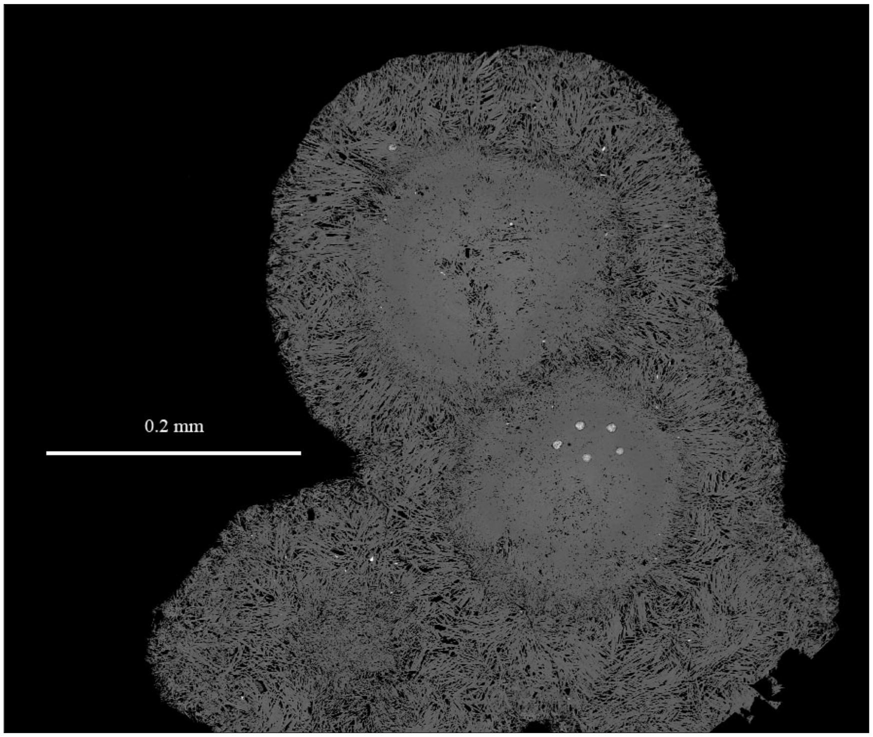

*Fig. 2. (above) Close view of tan-colored kamphaugite-(Y) spheres associated with white laumontite and colorless stilbite. P. & E. Médard collection, photo by E. Médard.*

*Fig. 3. (left) Back-scattered electron SEM image of an equatorial section of kamphaugite-(Y)*

The mineral reacts strongly with effervescence to cold diluted HCl, suggesting it belongs to the carbonate class. The EDS spectrum indicates large amounts of Ca and Y, with minor quantities of Rare Earth Elements (Fig. 4). No other heavy element is present in significant quantity; however, the EDS technique cannot detect elements lighter than fluorine, which include H, Li, Be, B, C, and O. Strong decomposition of the mineral under the electron beam further suggests the presence of –OH and/or $H_2O$ groups. The unknown mineral is thus a hydrated carbonate of Y and Ca, with minor REE. There are only three such minerals reported in the literature: kamphaugite-(Y), kimuraite-(Y), and lokkaite-(Y). The habit and mineral association strongly suggest kamphaugite-(Y). Optical properties of the mineral were determined on broken out sheaves of crystals. For light vibrating tangentially to the hemispheres, the index of refraction was between 1.623 and 1.648; for light vibrating radially, the index was between 1.648 and 1.664. Reported indices for kamphaugite-(Y) in the original publication (Raade and Brastad 1993) are $\alpha = 1.627$, $\beta = \gamma = 1.663$, consistent with our measurements. Taken together, all these observations strongly suggest that the unknown is kamphaugite-(Y), although only an XRD pattern would give a definitive identification.

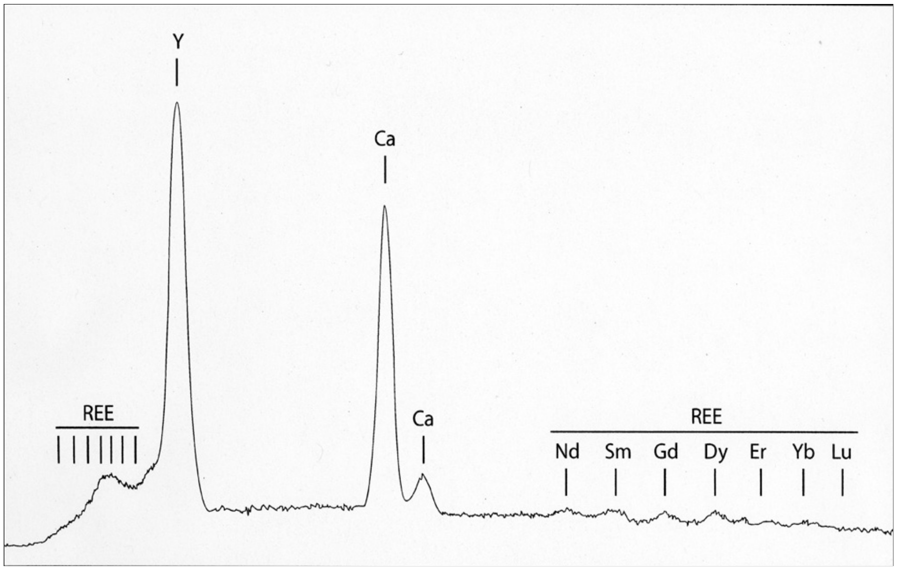

*Fig. 4. EDS spectrum of the kamphaugite-(Y)*

Kamphaugite-(Y) - $Ca(Y,REE)(CO_3)_2(OH).H_2O$ - was formally described in 1993 by Raade and Brastad from Norwegian material. This rare Y mineral has been reported in at least eleven occurrences so far: the Høydalen granitic pegmatite, the Hørtekolen skarn deposit and the Tangen pegmatite quarry, all three in Norway, a metasomatically altered alkali granite in Kazakhstan, a locality in Transvaal (South Africa), the Evans-Lou pegmatite in Québec (Canada), the Calla Francese Quarry on La Maddalena Island (Italy), the Rössling uranium Mine (Namibia), the Paratoo copper deposit (Australia), the Szarvaskö granite (Hungary), and the La Cabrera granitic pluton (Spain). We initially thought that the Aggregate Industries Quarry was the first reported occurrence in the United States. However, we later found on the web a reference to kamphaugite-(Y) and kainosite-(Y) from the Gronci-Ellis granite quarry, Mount-Desert Island, Hancock Co., Maine. Kamphaugite-(Y) might actually be much more frequent since those tiny spheres can be easily overlooked. Without the insistence of Lynn Bannon, our samples might indeed have ended up in the "crappy unknowns not worth caring for" category.

Kamphaugite-(Y) forms as a late-stage mineral, as a result of low-temperature hydrothermal alteration of other yttrium-bearing minerals in granitic rocks. The Ashland occurrence closely compares to the well-described occurrences at Calla Francese (Gamboni and Gamboni 1998, Gamboni 2003) and La Cabrera (Gonzales del Tánago et al. 2006). In all three occurrences it is closely associated with calcite, laumontite, and stilbite, minerals characteristic of low-temperature hydrothermal crystallization. Oxygen isotope studies on samples from La Cabrera (Gonzales del Tánago et al. 2006) suggest temperatures of formation lower than 50 °C. Hydrothermal activity is characterized by percolating downward groundwater which interacts with warm rock at depth and comes back as ascending hydrothermal solutions. Water leaches mobile elements like yttrium from the host rocks, and reprecipitates them in the seams and cavities. The primary source of yttrium could be gadolinite, zircon, garnet, xenotime, or monazite... At La Cabrera and Cala Francese, other secondary yttrium minerals have also been found, including agardite-(Y), bastnäsite-(Y), hellandite-(Y), kainosite-(Y), tveitite-(Y), and thalenite-(Y).

We invite you to look closely at your Ashland material and at samples from other “alpine-cleft” localities. Secondary yttrium minerals may not be as rare as previously thought…

## References:

*Cahoon J.C. Massachusetts: a classic Swiss alpine cleft mineral region.*

*Gamboni A., Gamboni T. (1998) Isola di La Maddalena, (Sassari): Kamphaugite-(Y) di Cala Francese. Rivista Mineralogica Italiana 1998/2: 27-28.*

*Gamboni A. (2003) Su alcuni minerali provenienti dalle cave di Cala Francese, isola di La Maddalena (SS). AMI Micro , 11-20.*

*Gonzáles del Tánago J., La Iglesia A., Delgado A. (2006) Kamphaugite-(Y) from La Cabrera massif, Spain: a low-temperature hydrothermal Y-REE carbonate. Mineralogical Magazine 70: 379-404.*

*Raade G., Brastad K. (1993) Kamphaugite-(Y), a new hydrous Ca-(Y,REE)-carbonate mineral. European Journal of Mineralogy 5: 679-683.*

# The Micro Collector's Workshop

## "Its all about the light"

Tom Mortimer

In my twenty plus years of micro mineral collecting I have used about five or six different light sources for my scope. Early on, I tried several different commercial "high intensity" lamps, (examples, Figures 1 & 2). While adequate, these never measured up to the performance of a professional microscope illuminator. My first experiment to build my own, using a high intensity halogen flashlight bulb and a modified lamp base, was pretty much a disappointment, especially with regard to light intensity, (Figure 3).

**Figure 1**: Commercial High Intensity Lamp.

**Figure 2**: Another commercial High Intensity lamp, clip-on style.

**Figure 3**: My first home-built microscope illuminator.

A damaged microscope fluorescent ring bulb lamp, salvaged from the trash at work, was repaired and tried. These lamps, (Figure 4), fit around the lower lens of your scope and give a nice, even, 360 degree, illumination, but the overall brightness is quite low. Also, the light color is a bit on the fluorescent bulb blue side.

**Figure 4**: A repaired commercial fluorescent ring bulb illuminator salvaged from the trash.

Deterred by the $300, (and up), price tag for a dual output fiber-optic illuminator, I was motivated to "press-on" with my home-made illuminator experiments. A high intensity lamp made by SOLUX caught my attention, (https://www.solux.net). These lamps have a color temperature that closely matches that of natural sunlight. The unit I selected, model 3HHT809WH, (at $34.00 plus $7.95 for a bulb), although not super cheep, appeared promising. I placed my order on the web and my unit arrived a week later.

The model I purchased needed some adaptation in my workshop to be suitable as a scope lamp. The 3HHT809WH is intended for use with track lighting, so first it was necessary to solder on a lamp cord to the track light contacts and add a series ON-OFF toggle switch. A plastic block base was then attached to the lamp unit with a slot to allow the lamp cord to exit. Finally, a ¾ inch PVC coupling was attached to the plastic block/lamp-unit using a pair of 6-32 screws. The PVC coupling was slotted lengthwise to allow it to expand slightly, (figure 5).

My lamp base started with a 6” x 8” slab of ¼ inch steel, (from my scrap metal pile … I keep way too much stuff, but, sometimes its handy!). A wood base could be used alternatively, but a heavier metal base adds stability. I bolted a ¾ inch PVC threaded end cap to this base and screwed in a 2 foot length of PVC pipe. The slotted PVC coupling on the lamp assembly slides tightly over the PVC pipe. A plastic knob set screw, ($1.00 from my local hardware store), holds the lamp assembly at the desired height on the stand pipe, (via a tapped hole in the PVC coupling). A section was cut from an old computer mouse pad mat and contact cemented to the bottom of the steel plate. This keeps the illuminator from sliding too easily and prevents marking your table when in use. My lamp base is shown in figure 6.

When on, this lamp puts out A LOT OF LIGHT! But, it does get HOT. If your hand brushes against the bulb shield, you will get a quick reminder of just how hot! I have read and heard that one must be careful with hot lamps and minerals with a high water content, (that “$\cdot H_2O$” piece on the end of many mineral formulae). From my own experience, after using this lamp for over a year, I do not believe I have damaged a single specimen by over heating. I have observed, with prolonged viewing of a specimen, the specimen box does feel significantly warmer.

My home built microscope lamp efforts did not end with this project. Next month: my dual, white LED illuminator.

**Figure 5**: SOLUX lamp fixture adapter.

**Figure 6**: Lamp base assembly, steel plate with PVC end cap bolted on. Mouse mat cemented to backside. Pipe detached for view.

**Figure 7**: Completed SOLUX microscope illuminator

Solux has changed their models a bit since I ordered mine over a year ago. I believe this part is the same as the one I purchased. Solux now also offers “Clamp on Gooseneck” lamp for about $77. with bulb. This may be a nice “ready to use” alternative.

## DIRECTIONS TO TRINITY LUTHERAN CHURCH, CHELMSFORD MA

170 Old Westford Rd., Chelmsford, MA.
From Rt 3, take Exit 32, (The "Drum Hill Rotary"). From Rotary, Take Old Westford Rd. towards Westford for about .85 miles to Grandview Rd. Entrance for Trinity Lutheran Church on left. Proceed up rather long driveway to parking area. If things go according to plan, we should be able to use the entrance on the far left side of the church. Our meeting room is just inside this entrance.

Those coming from the south may want to try an alternate route, exiting from Rt 495 at Exit 33, then taking Rt 4 north to a left onto Davis Rd…. see map below.

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