

BUILDING A FUTURE: THE MICROMOUNT COLLECTION-LABORATORY OF THE MCNB

by Carles Curto Milà



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Created in 1990, the Micromount collection of the Natural History Museum of Barcelona (MCNB) currently (May 2013) contains nearly 10.000 registered samples, including near 900 well identified mineral species and an interesting amount of well represented type localities.

In 2014 the MCNB has integrated the Masoliver collection, with a little more than 7000 samples, an important content of species considered rare and very rare, a noticeable contribution on type localities and an excellent representation of Spanish and Catalan mineral localities.

In the general background of the MCNB's mineralogical heritage, the collection is destined to grow as a major resource in Mineralogy, especially concerning aspects such as the correct identification of the species, well represented localities (with a special emphasis on type and Iberian localities), a complete description and images. The digital collection has been uploaded to the net in 2014.

Carles Curto Milà, Former Mineralogical Curator, Natural History Museum of Barcelona. Email: kcurtomila@hotmail.com. Received 1st May 2013. Accepted 23 June 2015.

The Micromount collection-laboratory, an idea, a target

With a wide tradition in the North-American mineralogy (Benge 1904; Beck 1914; Manchester 1931; Wills 1931; Speckels 1965; Learned 1968; Fuller 1970; Anderson 1981; Briggs 1988; Dunn 1990; Peters and Pearson 1990; Roe 1990; Grim 1991a, 1991b; Wight 1993; Smith. s/d) and, more recently, in the European one (Hanauer 1965, 1979-1980; Hentschel 1972; Kipfer 1972; Bois D'Enghien 1977; Argentini 1979; Gatel 1983; Vollstädt, Voigt and Vogel 1988), a micromount collection is formed of small mineralogical samples that need to be observed under a binocular microscope, between 20x and 60x magnification.

This kind of collection needs preparation of the sample that includes a complete cleaning (under the binocular microscope the organic matter and the powder used to be really noticeable and hinder the observation and further identification), often a trimming (that must be carefully done to avoid the destruction of crystals) and the process of mounting, in the strict sense, implying the inclusion of the piece in a neutral plastic box (used, at the same time, to individualize and preserve the sample, and as a sup-

port to its basic documentation). All this makes easier the manipulation, storage and quick ocular identifications.

Micromounts often have a varied, heterogeneous documentary content (Rich 1976; Rosemeyer 1991; Wight 1993) but what makes them really interesting and useful from the museological point of view is their thematic specialisation and a high documentary rigour. In this sense, defining the master lines of the collection and the quality of its documentary standards is especially important, fixing some main thematic axes and doing a very selective choice of every sample.

Examples of complete studies about precise localities that hand-samples do not permit include Manchester (1931), Kraissl (1982), Hentschel (1983) and Abella and Viñals (2012) or about conserving mineral species that are rare or very rare or simply inexistent as macro samples (Wise 1978).

Understood some years ago as simple complementary collections and added as a support for a "main collection" (the classic collection of hand-samples) or even as a simple mineralogical amusement (Anderson 1983-1984; Peters and Pearson 1990; Roe

1990; Rosemeyer 1991), micromount collections have been progressively acquiring a strategic character as a basic source of information for an increasing demand with scientific purposes, and as a reservoir of lithological material for research groups or for single user interest.

Public museums with their professional curators, assuming a continuous scientific activity through time, can (and must) be centres of reference for this kind of collections (Oswald 1971), being ideal, due to their characteristics and endowment of specifically devoted personnel, as a documentary repositories and points of habitual consultation (both in-person and online) for all kind of users.

Currently, due to the typology of their contents, the delicate process of mounting and the amount of documenting that they require and generate, micromount collections transcend their role of simple mineral collections and acquire the more complex character of a collection-scientific laboratory.

The collection of the MCNB, the beginning

The MCNB's micromount collection was created in 1990 after a suggestion from two prominent collaborators of its Department of Mineralogy, Dr. Manuel Masoliver and Mr. Carmelo Sánchez.

At the beginning, it was just conceived of as a complementary branch of the major hand-samples collection on the MCNB but as it was growing it progressively acquired its own identity, building a context of reference for classic species and localities, mineral systematics and, specifically, as a representation of mineral species from the Iberian (mainly Catalan and Spanish) localities.

First steps of a singular collection

Further to a simple compilation of "small" or "binocular" samples, the first step to develop the collection was defining, in 1990, some main objectives and intentions to mark a style and the rigour as well as the internal and external projection of the collection.

One of the first activities dealing with the collection was an exhibition (Figure 1), in the year 2001, called "Els micromuntatges: minerals en miniatura" ("Micromounts: miniature minerals"). This exhibition included a case explaining the process of selection (from Nature to the laboratory), trimming, cleaning, orientation and mounting of each sample and the necessary materials to do all this. There was also an

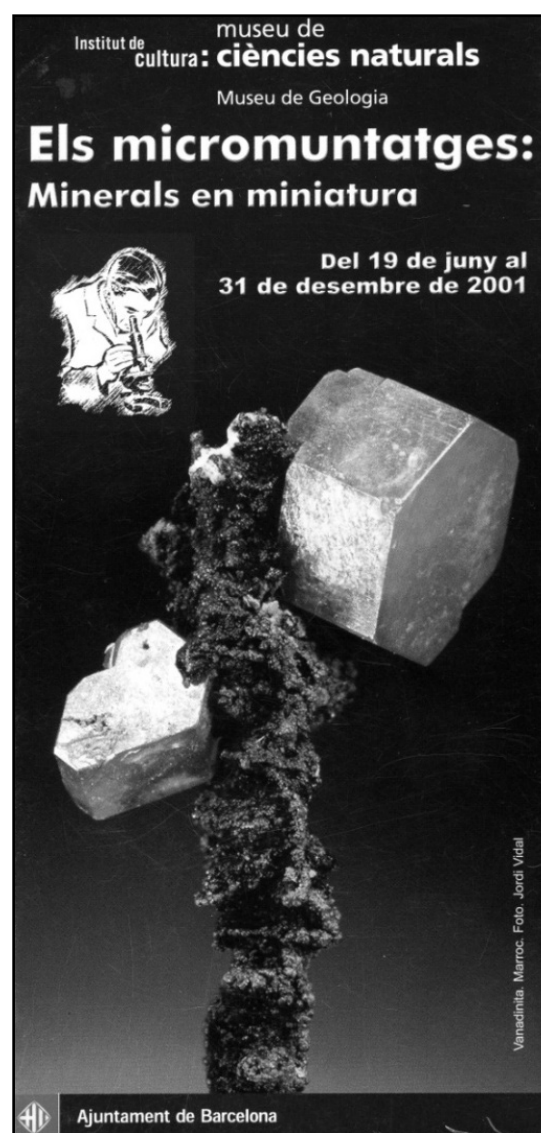


Figure 1. Front of the leaflet on the exhibition.

exhibition of big size pictures of some of the most impressive MCNB's micromount collection samples and a battery of binoculars with a selection of different minerals (systematic, local minerals, copper minerals...). The success of this exhibition forced the museum to extend it until 2003. As soon as it was possible (1995), a single room (Figure 2) was devoted to work with micromounts. The museum decided to name it Espai Masoliver (Masoliver Room) honouring Dr. Manuel Masoliver, collaborator of the Department of Mineralogy and responsible for the mineralogical data, supervised by the present curator (and author of this note). The space was then equipped with the necessary furniture, PC terminals, a hydraulic press, binoculars and lighting equipment.

Once the Micromount room was installed (Figure 3), the main items were fixed. In the beginning (1990-1995) the first intention was simply to complete and complement mineral data on the heritage content that the mineralogical collection (hand samples devoted

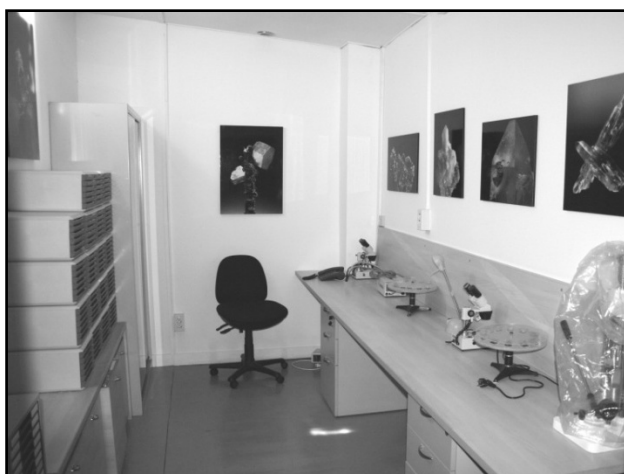


Figure 2. General view of the Masoliver Room on the Geological Museum (MCNB).



Figure 3. Work surface with basic equipment.

both to scientific and exhibition purposes) but this could not happen, due mainly to the lack of a specimen purchase budget.

This led to a basic focus on the two original reasons of the collection: establishing a close view on both the most interesting or rare mineralogical specimens in the hand collection, and on the samples from Catalan and Spanish localities of the hand collection. It required an opened and active data base, Microsoft Access in the beginning (1990-2000), and Microsoft Access and MuseumPlus (Zetcom Co.) since 2001 to deliver this and thus:

- The use of alpha-numeric systematic codification (Weiss 2008) with a monthly (Lapis Mineralien Magazin) and a general annual revision (IMA new minerals).
- A deep revision of the mineral localities (especially the oldest locality names which were very frequently erroneously transcribed or simply obsolete).
- The correct identification of doubtful or clearly misclassified species.

Defining a new policy and new perspectives

Focused on the immediate future as the main source of mineralogical information for the MCNB and its professionals and external users, the progress of the collection is being both theorized and practiced in spite of a menacing future for them, due to negative socio-economic perspectives in Europe and Spain.

Even considering this reality, the special characteristics of the Micromount collection allows continued work to proceed in spite of the worst possible hazards. In fact, it doesn't occupy a great situation but it is still possible to develop it with a scarce budget and just with an essential bibliography as well as optic, photographic and informatic equipment. In parallel, to establish a good planning and policy is just a question of imagination and rigour.

The project will continue the immediate and future work in three main items:

1. Initial collection: with more than 2000 samples, it is correctly stored and documented and labelled with the corresponding individual register number agreeing to the Weiss code (2008-2012). The names of species are databased in Catalan, Spanish and English to make the search easy. The data are compared on a monthly basis to Neue Mineralien, Lapis Mineralien Magazine and IMA new species. The initial collection, first independently registered, was later integrated (2004) in the general register (Mineralogy Dept.) in order to work on the general documentation of both collections (micromount and hand-sample collection) as a single one.
2. Masoliver collection: with almost 7000 samples arrived to the Museum in November 2014 through Dr. Manuel Masoliver, owner of the collection and collaborator of the Mineralogy Department. The update and revision of this permanently increasing collection has been made both at the home of the owner itself and in the MCNB's Mineralogy Department. A progressive and selective incorporation of small clusters of samples from this collection could be a good way to work with it, allowing the progressive incorporation of data to the net, according to definitive official register numbers.
3. Future collection: the rich contents of the current collection of the Museum and the added Masoliver collection will allow the design of a very well defined and selective policy of growth and documentation.

Due to its characteristics as collection and as a source of documentary data and mineral repository, and due also to the interrupted work on it, the Micromount Collection, including both the Masoliver and the initial collection, has been reconsidered as Micromount Collection and Laboratory and created as a resource for geodiversity (mineral materials for knowledge, research, mining heritage and diffusion) in the Museum.

The collection is especially rich in three key areas:

- Iberian species: a lot of well represented localities of Catalonia and Spain.
- Geodiversity: a wide content in mineral species (a lot of them considered as rare or very rare) and a good content of new species (IMA new species 2009-2012).
- Type localities: containing near 900 samples from their type locality, with nearly 400 type localities represented.

Those aspects reinforce the intention to build a solid documentary body based in:

- Basic documentation: database, complete description, bibliography...
- Bank of images: creation of a solid background of image information, not only as source of identification of each sample but also as a representation of morphologic and crystallographic diversity. Approximately 90% of the samples of the Masoliver collection are actually photographed as low resolution pictures.
- Implementation of external data bank: meeting other public (or private) data base to compare and complete mineralogical information.
- Ongoing review and discussion: about the documentary and collection contents and the revision needs.
- Permanent information: devoted to both professional and amateur publics.

Growth policy

The main interest of the Micromount Collection and Laboratory is to be continuously active and in permanent growth. Following the main issues and concepts previously expressed, it is now focused on a basic and selective increasing with:

- Common or rare mineral species related to the main geological traits of the Iberian Peninsula, especially Catalonia and Spain (mineral topography).
- Type localities: samples representative of type localities.
- Local collections: to define restricted clusters of species from specific mineral localities is specially significant to the documentation point of view (Manchester 1931; Kraissl 1982; Hentschel 1983; Abella and Viñals 2012).
- Rare or very rare species (mineral geodiversity).
- New species: described and accepted by the IMA in recent years (IMA new species 2009-2014) (mineral geodiversity).

All kind of possible administrative actions to acquire new samples are contemplated, with these being the most common:

- Donation: accepting singular pieces of complete collections from private individuals or institutions.
- Creation: of a net of single fellow donors, considered as collaborators.
- Prospection: programming selective collecting visits to specific localities.
- Legacy: occasional (as in the case of the Masoliver collection).
- Purchase: always selective and focused on the major traits previously expressed (but mainly dedicated to new and rare or very rare mineral species).
- Exchange: with private individuals, societies of micromounters, universities and museums.
- Deposit: temporal deposits can be accepted in function of their interest or documentation contents.
- Change of location: those samples in the General collection (hand collection or macro) that being not strictly micromounts are very small (some small crystal diamonds, for example) could be integrated into the Micromount collection (it represents a simple exchange of attribution in the database).

The projects that need to consolidate a specific annual budget or investment (i.e. prospection and purchase) could begin in 2015 depending of the eco-

conomic and administrative conditions, while the other items remain plentiful active. We note that a budget for purchase in the actual mineral market allows the "low cost" and we can affirm the same for accessing and working in near mineral localities.

The team

The project requires the tasks of a basic team that includes:

- A mineral curator: not devoted full time to the collection.
- An assistant curator (or an external documentation person specialised in mineralogy): devoted to the Micromount Collection.
- One or more collaborators (without direct economic cost).

Documenting

Documenting is a specific key word to define the objectives of the Micromount Collection and Laboratory and for the success of its development and existence. All decisions about the content of the different documentation aspects (species name, locality, collection of precedence, systematic position, description...) inform the final intention of the collection being consulted by a wide range of users.

In order to create a source for internal and external consulting of mineral data, to elect good and stable

data-base software is necessary. For any agile work, listings, quick consultations etc., the most common commercial software (as Microsoft Access or FileMaker Pro) is very useful. The MCNB's Mineralogy Department is currently working in parallel, at the same time, with Access (Microsoft) and MuseumPlus (Zetcom Co.), a specific programme (Figures 4, 5) devoted to museum heritage, but it is not as useful and agile as the other cited programmes. FileMaker Pro has been proposed, for the near future, as the main database platform for daily work.

The systematic thesaurus (Figure 6) is based in the mineral codification of Weiss, S. 2008 (Das grosse Lapis Mineralienverzeichnis, 5 auflage), with monthly revisions in Lapis Mineralien Magazine (Christian Weise Verlag) until May 2015. It is comfortably agile for incorporating new species (IMA new species 2009-2015), noting obsolete, erroneous or doubtful mineral names and furnishing new or changing data. The Strunz-Nickel codes are assigned in parallel (Strunz and Nickel 2001).

Mineral species (and varieties) are registered with their Catalan name (as principal) (Garrido and Ybarra 2010) with their synonymies in Spanish (Díaz Mouríño 1991), English (Back 2014) and, for significant cases, in German (Weiss 2008), French and Italian, all of this in order to make research easy.

The screenshot shows the MuseumPlus software interface. The top bar contains various icons and the ID 'Id ColH 1019314'. The main area is divided into several sections. On the left, there's a 'Col·lecció' (Collection) section with a dropdown menu set to 'Geologia - Mineralogia'. Below it are fields for 'Núm. registre' (Registration number) with 'MGB 18231', 'Cat. general' (General category) with 'Mineralogia', 'Nom científic' (Scientific name) with 'Volborthita', 'Autors / participants' (Authors / participants) with 'no informat', 'Any d'inici' (Start year) and 'final' (End year) fields, and 'Lloc proced.' (Origin location) with 'Escorca'. On the right, there's a large image of a mineral specimen. Below the image are several smaller thumbnail images. The bottom section contains a 'Identificació' (Identification) tab with sub-tabs for 'Història Espècimen/Ingrés', 'Recol·lecció', 'Associació/Elements', 'Mineralogia', 'Descripció formal', 'Dades complementàries', 'Estat de Conservació', and 'Conserv'. The 'Identificació' tab is active, showing fields for 'Dimensions / Coordenades' (Dimensions / Coordinates) with '2,7 x 2,2 x 1,1 cm', '0,1 x 0,1 x 0 cm (agregat pral.)', and '7,228 g'. Other fields include 'Material/ Técnica', 'Precisions geogràfiques' (Geographical coordinates) with 'Paratge: El Lluc (m) (Mina de coure a la vall d'Aubarca, prop del sai)', 'Inscripció', 'Mus. depositari' (Depository museum) with 'Museu Geologia', 'Prestador', 'Ubicació actual' (Current location) with 'MN/MMT/CL', 'Ubicació habitual' (Habitual location) with 'MN/MMT/CL', 'Prec. ubic. habit', 'Fitxa/Conjunt' (Sheet/Group) with 'Fitxa', and 'Llengua' (Language).

Figure 4. Card MuseumPlus of a sample of Micromount collection.

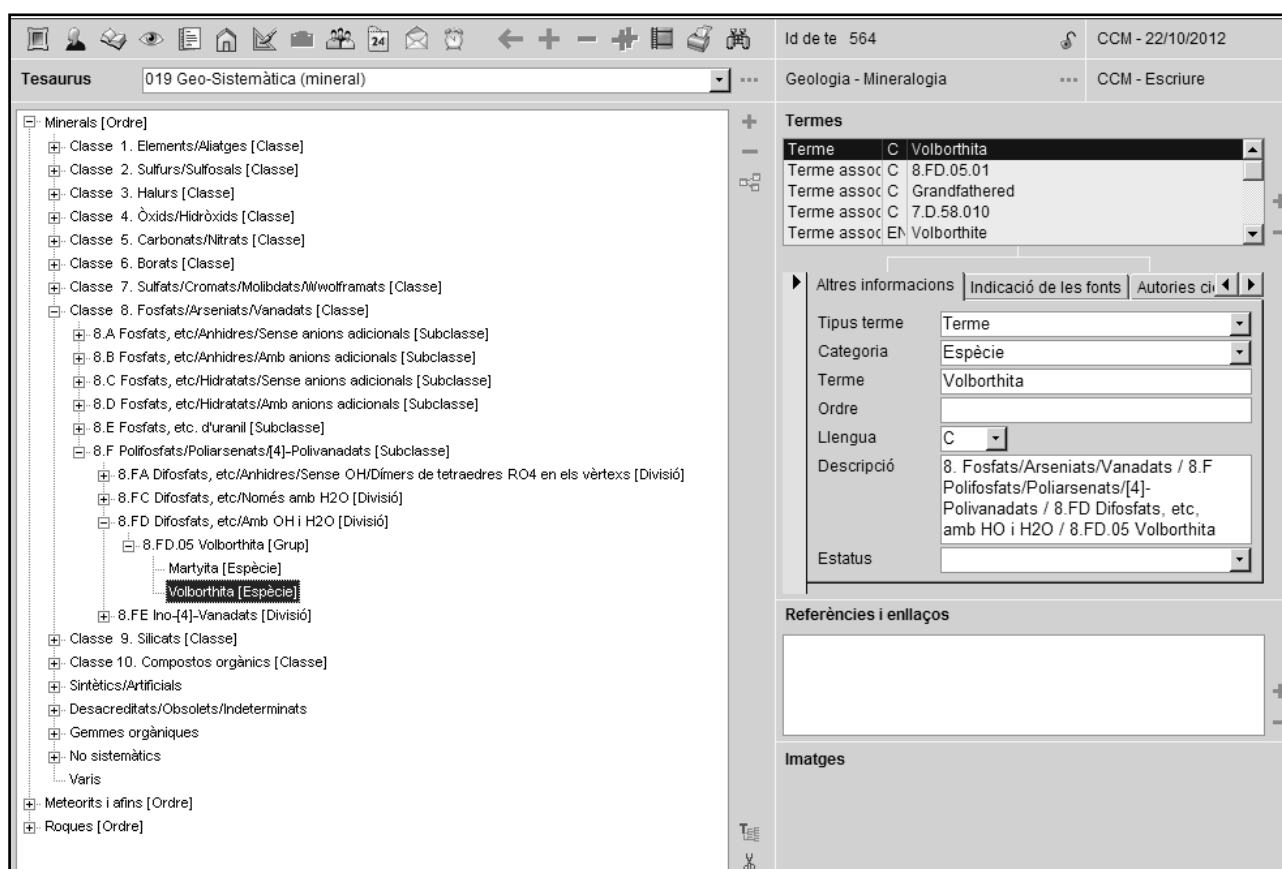


Figure 6. A view of the systematic thesaurus.

A lot of idiomatic variations, local spellings and historical toponymic forms are being added to the thesaurus in order again, to make the consulting easy and rich. Although the variations create additional work, it is good to incorporate them into the thesaurus, considerably enriching its content and context.

Finally it adds some no-systematic mineralogical categories as rocks (including meteorites), mining materials and products, synthetic and artificial products and indeterminate, discredited, or obsolete mineral names as well as organic gem material, ivory, coral, bone...).

The Micromount Image Bank

If nowadays the image is considered as an important resource of any online mineralogical database, they are essential for micromounts (Hanauer 1979-1980; Gatel 1983; Harker 1984; Betz 1990; Benkhe 1991).

The creation of a solid background of image is necessary not only as a source of comparison for identification but also as a graphic representation of the morphologic and crystallographic diversity and as a photographic bank for museological diffusion and for education purposes and to illustrate scientific or educational articles, books, leaflets, etc., both in and out the Museum.

It has been considered basic to choose optical equipment that allows the capture of images of enough quality to be published, with optic resolutions that macro-photography does not cover, nor the photography applied to the usual microscopes, due, basically, to the difficulties of working with a sensitive field depth.

Figures 7 to 12 illustrate a few of the specimens in the micromount collection.

Needs for a new space and equipment

La Col·lecció-Laboratori de Micromuntages (Micromount collection and laboratory) is considered as integrated on the mineralogy working area and, thus, the spatial standards and the equipment (excluding the general storage area and furniture of the mineralogical general collection that, for their volume and characteristics, need a separate treatment) are not exclusively devoted to micromounting.

The proposed future dedicated surface (including the office of mineralogy and the collection-laboratory of micromounts) has been estimated as requiring a minimum of 50 square metres (for four people) divided in two areas: dry and wet.

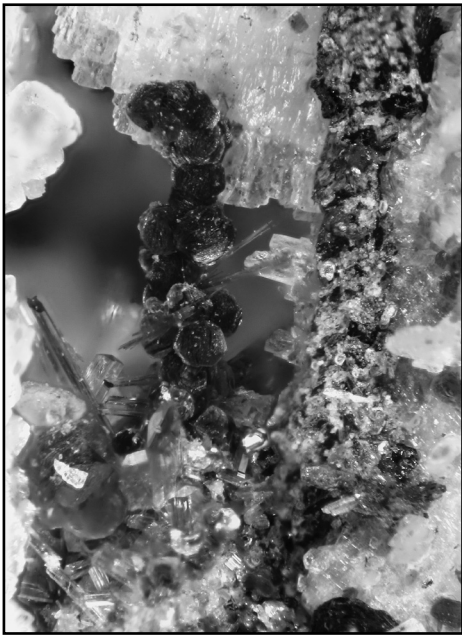


Figure 7. Chlorite from Toras, Spain.



Figure 8. Synchisite from Trimouns Mine. Luzenac, Midi-Pyrénées, France. Crystal is 2.5 mm long.

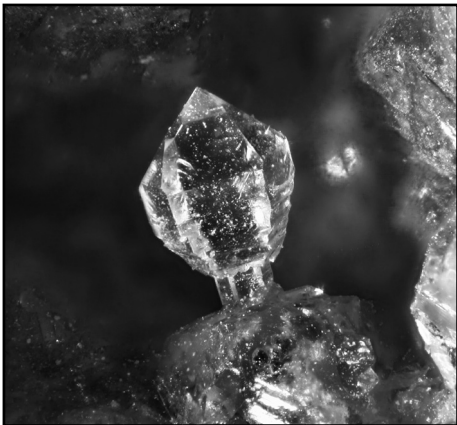


Figure 9. Quartz from Tibidabo, Barcelona City, Catalonia, Spain. The crystal is 1mm long.

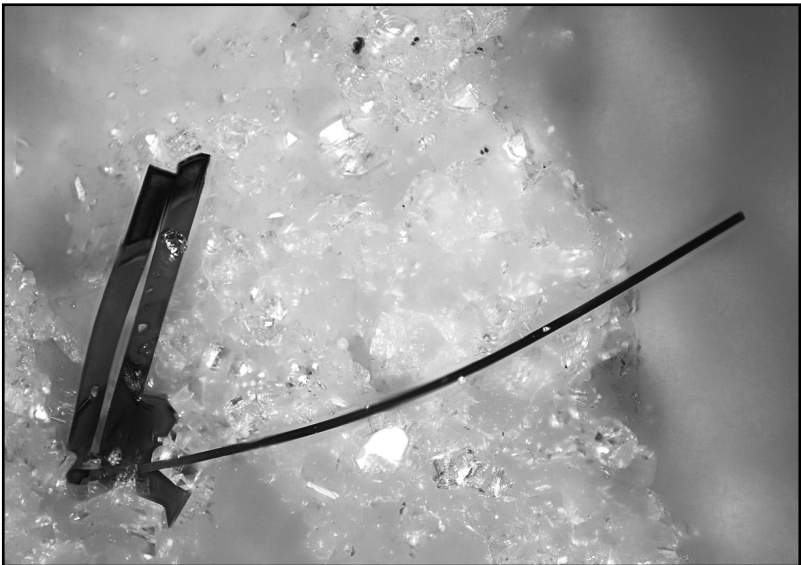


Figure 10. Lengenbachite from Lengenbach quarry, Binntal in Switzerland. The specimen is 5mm in width and was found in 1978 by T. Imhof.



Figure 11. Sphalerite from Lengenbach quarry, Binntal, Switzerland. Crystal is 2mm long.



Figure 12. Pumpellyite from Toras, Castellón, Spain.

Basic implementation

Local water services

- Ceramic sink 150 x 50 cm (with ceramic outlets)
- Cold and warm water.
- Tap and outlet for ultrasound equipment.
- Work surface(acid resistant) 400 x 60 cm.

Furniture

- Desks 280 x 70 cm. (minimum 4)
- Cupboard for tools and products (glass door). 170 x 100 x 40 cm.
- Cupboard for samples on process (glass door). 170 x 100 x 40 cm.
- Cupboard for clothes and personal belongings (opaque door) (2 cupboards) 170 x 100 x 40 cm.
- Low furniture with sliding doors (as a support of the furnitures for micromount collection storage).
- Plastic furniture of booths to store the micromount collection.

Informatic equipment

- PC terminals with the adequate software (including usual net programs).
- Telephone supply devoted to voice and net connection.
- Image caption software connected to PC terminal.

Optic equipment

- Nikon binocular SMZ-10 (10x to 60x) (detailed observation).
- IMCOT binocular (or similar, for quick observations and mounting process).
- Field microscope Peak 20x / NA 0.06 (punctual observations, field trips or visits to other collections).
- UV lamp UV-Leuchte LS-4 (220V/50 Hz): (long and short ultraviolet wave).

Mechanic equipment

- Maestra 500 hydraulic press (separate and prepare pre-samples).
- Zuber MP5 press (separate and prepare definitive samples).
- Reininger EMMMI 20 ultrasound equipment (260x150x220 mm/150W) (initial cleaning of samples before their definitive preparation and mounting).

Other materials

Plastic boxes: currently samples are prepared in transparent plastic boxes 3x3x1 cm. We may consider and discuss using some other alternative sizes. If a

unique model assures a low cost and a standard storage and minimizes the risk of misplacement, different models would allow a wider range of sample sizes and reduce the trimming effects and the danger of fracture or disappearance of crystals.

Final remarks

In the near future an increasing demand for information and solid mineralogical materials for a wide range of scientific research, educational and even industrial needs will justify the existence of the museum collections and reserves. At present, the micromount collections, as a future reservoir of mineral knowledge, are not yet really significant in most of the main European museums but there are a lot of very advanced and local collectors all over the world involved in building important collections of this kind, following a wide range of policies: localities, species, concrete systematic groups..., really a wide background of mineral heritage.

In the next years, a lot of these collections could be integrated in major or local museums... if they are prepared to receive them. With this aim, to understand their real potential and begin to build and develop micromount collections in the museums is not a nonsense (or minor) task. To develop policies of knowledge and cooperation with individual collectors (and, of course, with other museums) should be an interesting line to catch private collections for the future. The hidden force of this type of collections should be the attractive point for an immense baggage of mineral knowledge that "hand collections" are not always able to include.

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