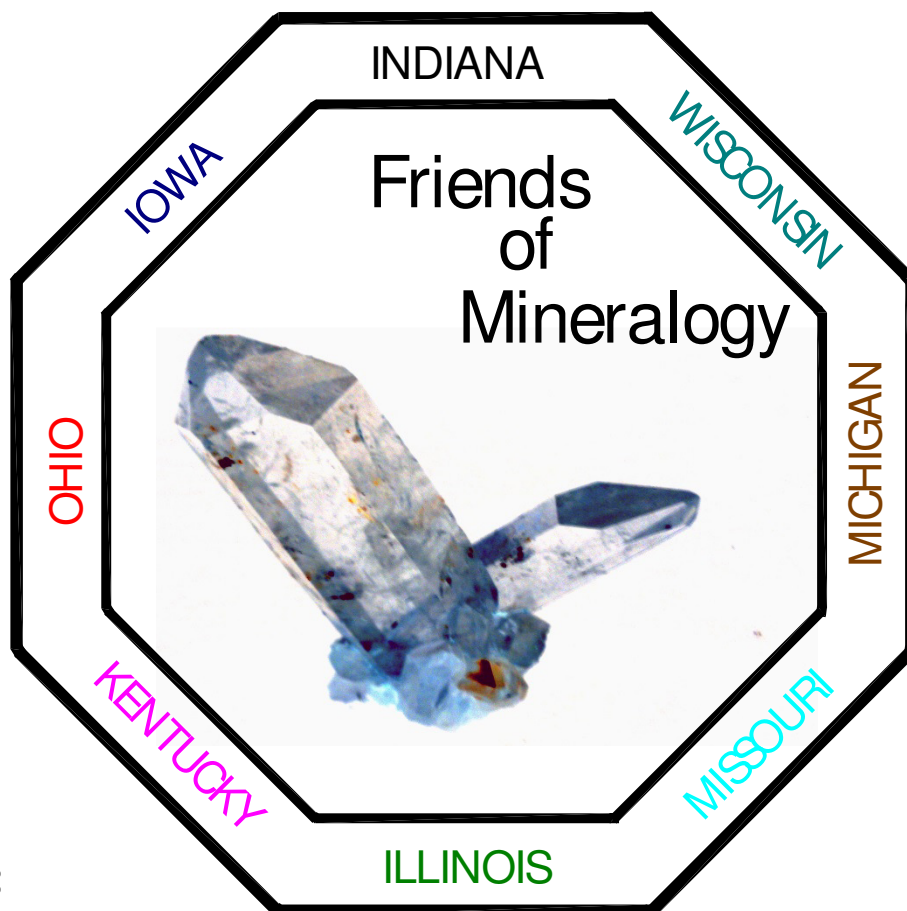


Friends of Mineralogy

Midwest Chapter Newsletter for
January – February 2015



Affiliations:

THE MINERALOGICAL RECORD

THE MINERALOGICAL SOCIETY OF AMERICA

AMERICAN GEOLOGICAL INSTITUTE

ROCKS & MINERALS MAGAZINE

Our purpose is to organize and promote interest in and knowledge of mineralogy; to advance mineralogical education; to protect and preserve mineral specimens and promote conservation of mineral localities; to further cooperation between amateur and professional and encourage collection of minerals for educational value; and to support publications about mineralogy and about the programs of kindred organizations.

Newsletter published bi-monthly in January, March, May, July, September and November. Please submit all information for publication in the newsletter by the 15th of the previous month.



See field trip reports from Williamsport and Genoa in this issue.

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Our first event of 2015 will be at Wittenberg University (Springfield, Ohio) on Saturday, January 10, from 1-4 PM. Our host will be Dr. Ken Bladh, Professor of Geology. Dr. Bladh has expertise in mineralogy, economic geology and scanning electron microscopy. We will have a short Chapter meeting, a presentation from Dr. Bladh (topic TBD), a tour of the facility (including the mineral collection), and a demonstration of SEM EDS. Chapter members can bring specimens to be analyzed.

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A “Real” Rockhound guarding his finds!



Friends of Mineralogy

From The office of the President

Clyde Spencer

trade show in mid-November. I want to publicly thank Randy Marsh for making this happen, and for providing some pens and mugs as test marketing items. FM members Reggie Rose, Scott Kell, and I staffed the table all day Thursday and Reggie closed things up Friday morning. We made some good contacts that I expect will lead to future new collecting opportunities. Reggie took the opportunity to invite Dr. Tom Serenko, Director of the Ohio Geological Survey, to attend our field trip to Graymont Dolomite in Genoa the following Saturday. Tom was quite appreciative of the opportunity to view firsthand mad men climbing over boulders with hammers in hand with conditions of a light wind and temperatures in the low 20s. I'm sure he was impressed with how 'hard core' our chapter's collectors are!

We had a good collecting trip to New Holland (Williamsport) the preceding weekend. There were some sparse pockets of calcite crystals. However, the highlight of the collecting was marcasite and pyrite(?) in the shale overburden. Tom Bolka, who was riding with me, found a 140 pound piece of marcasite that he wanted to take home. However, I didn't want to risk doing damage to my new Subaru Outback so I balked at loading it in my car. The Chinese-style 'cabinet piece' went home with John and Jay Medici with intentions of donating it to a museum. Reggie will have pictures and a more detailed description of the outing elsewhere in this newsletter.

Plans are proceeding for a January meeting at Wittenberg University in Springfield [see the formal announcement] and the third annual mineralogical mini-symposium at Miami University (MM@MU); more details will follow as we get closer to the March date (the 'Ites' of March).

I will be attending the annual Tucson show in February. I will get there in time to attend the FM general membership meeting on Tuesday before the main show, and attend the National FM business meeting as a representative of the Midwest Chapter. I have been invited by the current FM National president (Alan Young) to accept nomination for the position of VP of National and thereby also serve on the Board of Directors. I have agreed to be on the slate of officers. If elected, it will be a long-term commitment, which I hope I live long enough to fulfill!

If you haven't already done so, it is **time to renew your membership** for 2015; you will find an application form attached to the end of this newsletter for your convenience. Also, the executive board has agreed to require members

President's Message

Our annual business meeting in Cleveland went well, with at least ten FM members present. The slate of officers was re-elected. I was also re-elected in a separate action. See the Minutes, courtesy of Ann Cook, for more details.

There have been some first's for the chapter: We had a formal presence (that's academic-speak for a table) at the Ohio Aggregate and Industrial Minerals Association's (OAIMA) annual meeting and



to sign a Hold Harmless agreement to attend field trips. It also can be found at the end of the newsletter. I suggest that you bring it with you to the first field trip you attend so that Reggie can witness your signature.

Lastly, we have something else new this month – a guest article from a friend in Colorado.

FRIENDS OF MINERALOGY INC., MIDWEST CHAPTER

Meeting notes for November 8, 2014

The meeting of the Friends of Mineralogy, Midwest Chapter, was called to order by Clyde Spencer, president, at 3:35 PM, Nov. 8, 2014 at classroom A in the Cleveland Museum of Natural History. A quorum was determined to be present. When Clyde called for old business, there was none brought up. He then opened the meeting to new business. Treasurer Jeff Spencer reported that the treasury showed a balance of \$1,158. He said that some members had already paid their dues for 2015. John Medici moved to accept the report, which was seconded; the motion passed unanimously.

The next item on the agenda was the election of officers for the year 2015. The slate was as follows:

1st vice president	Randy Marsh
2nd vice president	Reggie Rose
Treasurer	Jeff Spencer
Liaison to National	Nelson Shaffer

Clyde called for nominations from the floor; there were none. Anne Cook moved to accept the slate as presented; the motion was seconded. It passed by acclamation. Sharon Fox moved that Clyde Spencer be president for 2015, it was seconded, and again it passed by acclamation. No one present was willing to take the secretary's job and there were no nominations from the floor.

In other new business, Clyde reported that he and Reggie would be going to the Ohio Aggregates and Industrial Minerals Association meeting in Columbus for the first time. This is the trade show for quarry owners, and they will have some specimens from Ohio quarries, and hope to emphasize that we are a group that is safety-oriented and trustworthy. Randy chairs a committee to have safety training specifically for collectors. Scott Kell, of Columbus, has developed such training; Randy's committee needs to sort out how to get MSHA and ODNR approval. On other new business, Clyde said that he had had no feed-back from his president's note in the last newsletter about ethics. He felt that the AFMS code of ethics mixed ethics and safety matters, and that they needed to be separated. Clyde will circulate proposals for member reaction, and then take a vote by mail for possible adoption of a code of ethics. Randy said that the next symposium at Miami University in the spring would be on native metals. There is a field trip to Genoa next Saturday. The next general meeting of the chapter will be in January, date to be announced. Clyde is planning to go to Tucson to the National annual meeting, and will bring up items from the chapter (so get them to him).

Jeff Spencer moved to adjourn the meeting, which was seconded. The motion passed unanimously and the meeting formally adjourned at 4:40 PM.

Respectfully submitted,

Anne Cook, secretary pro tem

Treasurers Report - As of 12/15/2014, 12 members have paid their dues for 2015. This brings the amount in our treasury to \$1258.29. Please use the form in the newsletter to send in your dues for 2015 as soon as possible. Don't forget to include the check and make sure to include any address, phone or email changes.
Jeff Spencer - Treasurer , Friends of Mineralogy Inc., Midwest Chapter , 513-476-2163

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Greetings FMers.

Perhaps this comes as news to you all, but we have a president who is visionary. As one of his visions, our president Clyde Spencer felt it would be a good idea to begin to reach out to people and organizations akin to our interests, and to try to develop positive relationships between us and quarry owners. So our program VP, Randy Marsh picked up the ball and got FM a table at the Ohio Aggregates & Industrial Minerals Association (OAIMA) convention held in Columbus at the Hilton Easton November 13 and 14. Being at this convention not only gave us exposure by our presence, but also allowed us to talk to quarry personnel about mineral collecting.

The OAIMA convention allowed us to talk with old friends of FM in the form of quarry superintendents, but perhaps more importantly allowed us to meet with regional managers and safety specialists that one would never meet on a visit to a quarry. Meeting with a quarry superintendent may get us a trip to that individual's quarry. Meeting with mid and upper level personnel allows FM to meet people sympathetic to our endeavors that have knowledge and control over several quarries in a given company. This can only help us open the opportunity for future field trips. Involvement in this type of activity represents a type of creative thinking outside of the box that can help our chapter in its quest for quarries. Another positive here was that the activity was indoors at room temperature and the food was wonderful.

Thanks Clyde - my hard hat is off to you!
Reggie Rose

termination of the crystal. John and Joe Vasichko (Wooster, OH) discovered both rhombohedral and scalenohedral calcites, clear to honey-colored, sphalerite clusters and single crystals, marcasite, and barite on calcite. Clyde Spencer's sulfide discoveries were outstanding. Though my photos did not do his pyrites justice, he did discover some pyrite on which I would swear I saw pyritohedral faces. His real beauty was a textbook marcasite which had a spear point termination in a field of crystals approaching a cockscomb arrangement.

Field Trip Reports

WILLIAMSPORT PROVIDES A FROSTY GREETING FOR FM

Old Mother Nature has been unkind to us this year. Although the 2013-14 winter was a bit nasty, at least the worst part held off until late fall. This year in central Ohio, our fall season gave us winter-like conditions by October 18. We had our first frost November 01 (late), but our first measureable snow (3") on November 2nd (early)! Goodbye fall! When I got out of my truck at the quarry I was greeted not only by 17 other collectors, but by 30 mph winds which made getting paperwork done interesting. Though the weather was cold, our quarry host and the collecting were much warmer. After a bit of a slow start, our stud FM collectors (most of the club) started finding stuff all over the place.

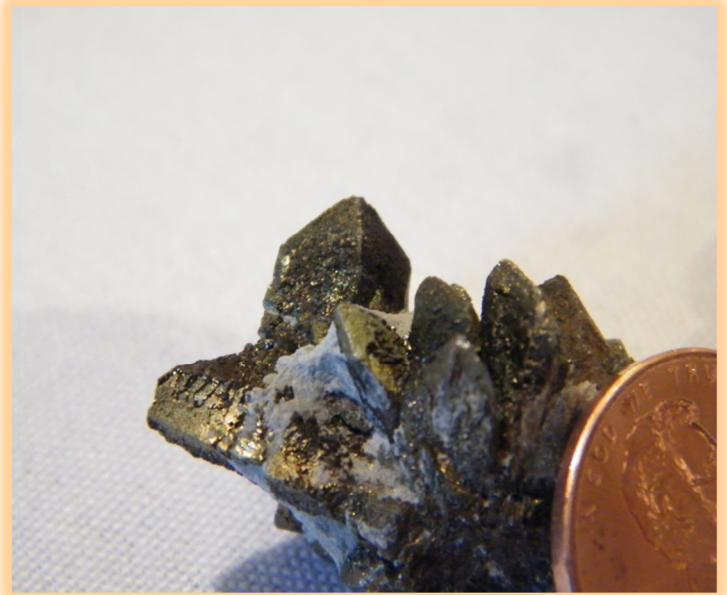
To mention fossils only briefly, Allen Dewitt (Richmond, IN) found a very large trilobite and horn corals up to 9" long littered the quarry everywhere. Though our newsletter editor may not have expected many photos from this trip, I would up with quite a few. Pam Lauer (Crestline, OH) came up with a pyrite nodule the size of a cantaloupe. Mike Royal (Defiance, OH) had clear to brown calcite specimens and sphalerite; Jay Medici (Fredericktown, OH), Clyde Spencer (Fairborn, OH) and Tom Bolka (Xenia, OH) were amongst a group who struck it big with several pockets of

scalenohedral calcite with razor sharp points on the

In addition to all these impressive finds, as I was ready to go home to go to work, Tom Bolka called me up on the pile (a long journey up and down). He beckoned to me to get a photo of their latest find. I inched my way over to where the group was and saw perhaps a historical find. It was a pyrite nodule whose approximate dimensions were 24" x 15" by 12". Being reluctant to take it home, Tom decided to let John Medici (Ostrander, OH) have it. It always humors me to see some of the things that John takes home. Remember the song about the miner "Big bad John" as sung by Jimmy Dean. I think that we have a new nickname for John Medici - that is "Big John". I can tell you that he has a minimum of weeds on his property because he leads the world in taking home huge yard rocks. This pyrite nodule has to weigh in at 150 pounds or more. The quarry operator had to take it out with a large track hoe. Though John is a serious collector, he also has a wry sense of humor. As opposed to lugging this thing around the yard, John has decided to donate it to the Orton Museum at Ohio State. Good luck to the poor recipient there, Dale Gnidovec. I am glad that I shortened my pre-work nap to get a look at one of the largest pyrite nodules ever found in Ohio, it was well worth freezing and missing sleep.



Pyrite – Pam Lauer



Marcasite – Clyde Spencer

GENOA: A COLD BUT FITTING FINALE

As our luck would have it, the weather was no better at Genoa than it was at Williamsport two weeks earlier. Collecting may not have been as strong here as it was in 2013, but it was still worthwhile. In all, 28 FMers made the trek to this northern Ohio bastion of minerals. The usual mineral suspects were all there in their glory: white, bladed celestine, clear to tan fluorite, yellowish and white scalenohedral calcite, and amber glassy sphalerite. What you collected here depended on a sharp eye, and a little luck.

It is always good to see my fellow collectors, but it is especially gratifying to see those of you who do not make most of our trips. I know many who are strong collectors, but due to other commitments can't regularly attend. Three such people fall into that category for this trip, and this article is about their finds.

One person is Mick Pinka (Belleville, OH). Mick is another FM stalwart who on any given day collects average to great specimens. Unfortunately, his collecting buddy, Lawrence Hull (Lexington, OH) was not with him as he had to work. If any of you know Lawrence, he had to miss the Clay Center trip because he took a hornet's sting right in the old eyeball. Ouch! So Mick did his best without his sidekick and found a fabulous sphalerite, amber and glassy, showing some tetrahedrons. This specimen rivaled Henry Fisher's find of a year ago at Genoa.

Two other collectors who have not been with us a whole lot this year are John Davis and Randy Marsh. John (South Bend, IN - our 2013 FM secretary) and Randy (Hamilton, OH - our present FM Program VP) had a really great day. Perhaps maybe the Mineral Gods cast a gentle smile on them, and nodded; you have not had many chances to visit a quarry this year, so this day shall be yours. They discovered several pockets in boulders with calcite, celestine and fluorite in them singly and in combination. Randy took the beauty of the day home, a 1-1/4" clear to light brown fluorite cube encrusted in celestine. For me, that one single specimen would have been worth the whole drive.

It even further warmed my heart to learn that they are collecting buddies. It is good to see friendships cross state lines.

Genoa was our last field trip for 2014. All totaled this year, we had 12 collecting opportunities at which we served 186 attendees. Of the 12 collecting trips, 4 were out of our region and drew 12 members. The other 8 trips, in region, drew 174 attendees.

Thank you all for blessing my camera with your wonderful finds.



John Davis & Randy Marsh – Calcite / Fluorite



Celestine / Fluorite – Randy Marsh

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**Remember! – Membership dues should be paid by March 1<sup>st</sup>. After that time they will be delinquent.**

# Some Observations and Comments Regarding Mineral Cleaning

Daniel Kile, Littleton, Colorado

Scientist Emeritus, U.S. Geological Survey and Research Associate, Denver Museum of Nature and Science

Below are a few personal observations and additions to Clyde Spencer's article on Chemical Cleaning of Minerals that appeared in the November-December issue of the Friends of Mineralogy Midwest Chapter Newsletter. These observations are based on 42 years of preparing my own field-collected minerals.

Spencer's article was perhaps a bit heavy on common-sense safety issues, but this is probably necessary in the present-day litigious and risk-averse society we live in. An interesting corollary to this is the decades-long decline in the availability of chemistry sets for children on account of an irrational fear of toxicity. One comment I might add to Spencer's article is that most people don't have in-home laboratory fume hoods, and work outdoors for much of the year can be problematic (not to mention pets and kids getting into cleaning vats). Then again, with some Darwin-Award candidates out there, one might well devote the entire article to safety (*e.g.* "Don't use without adult supervision; do not ingest or inhale; always wear safety goggles and full laboratory apron even when handling chemicals that can be found in the kitchen, *etc.* and *ad nauseum*").

An important consideration in mineral preparation is the dramatic improvement over the past 10 years or so in chemicals commercially available for cleaning, equipment used for trimming and preparing specimens (*e.g.*, Zuber trimmers *et al.*, micro-engraving and micro-abrasive equipment), and non-yellowing adhesives. When I first became active in the field (in the early 1970s), mineral repair was considered by many to be unethical, and some purists even thought chemical cleaning was irresponsible in that it destroyed the context in which the mineral formed. Now, with proper *repair* being commonly accepted, the debate has swung far to the right, to where discussion is about the proper level of *restoration*, (*e.g.*, fracture filling, "re-terminating" a damaged crystal, epoxy impregnation to improve color, *etc.*). Some of the issues regarding ethics were addressed in an editorial published in the *Mineralogical Record* in 1997, which I hope was a part of the events that started the conversation.

My general comments, observations, and personal experiences with some of the more commonly used acids and other chemicals follow; *readers are cautioned that they are solely responsible for the safe handling of the chemicals and equipment described below.*

## Facilities

Although I have worked in and around laboratories throughout my professional career, I have found that a decent 3-speed window or ceiling vent in the home is adequate for most projects. Caution is still necessary, especially when working around fuming compounds such as hydrochloric acid or ammonium hydroxide. Fuming compounds such as HCl should always be used in covered containers, and if heated, should be cooled to room temperature before further work.

## Cleaning

Some preliminary comments are in order. John Sinkankas's *Gemstone and Mineral Data Book* (1972) provides the most comprehensive detailed list of mineral solubilities and cleaning methods I've seen – it's well worth having. I have found Richard Pearl's *Cleaning and Preserving Minerals* (1982) to also be quite useful. Both references are now out of print and will have to be scavenged at the various bookstores on the Internet. Spencer (2014) also provided a useful table of



generalized mineral solubilities.

### Oxalic Acid.

I have extensively used oxalic acid. Composed of  $\text{H}_2\text{C}_2\text{O}_4$ , it effectively removes various hydrous iron oxides, but is not particularly effective with primary hematite. Its advantages are that it can be heated (preferably in a crock pot) for extended periods of time, it does not appreciably fume, and it is relatively quick acting compared to some of the chemicals commonly employed (see below). Inasmuch as it's a solid compound, I have not needed to be too particular about neutralizing it. I have heard from several in the mineral business who avoid using it, stating that that oxalic acid is toxic (isn't everything?) and could cause liver or kidney damage. The veracity of this comment is hard to assess; I haven't personally seen any reports on the subject, and in any event I can easily incur liver damage with other vices. The usual MSDS sheets on almost any chemical present dire warnings of toxicity, including common table salt. Frankly, if oxalic acid is ingested or particulates inhaled, there will be toxic side effects. But a reasonable level of common sense when using it will preclude adverse effects.

There are two drawbacks to oxalic acid when removing iron oxides:

1. It chelates with calcium to form an insoluble Ca-oxalate residue that will settle upon and indelibly coat the exterior of the mineral. A lot of residential tap water is quite heavy in calcium ions. Formation of insoluble oxalates can be avoided by using only distilled water that can be purchased readily at any grocery store.
2. Oxalic acid reacts with iron to form an iron-oxalate compound, which is a yellowish-colored solid. This compound will continually 'bleed' out of the specimen once cleaned, even if neutralized, and is especially problematic with porous minerals. Soaking the mineral in dilute phosphoric acid (followed by neutralization) will help remediate this problem, as the colored Fe-oxalate will be converted to a colorless Fe-phosphate compound.

### Phosphoric Acid.

Although phosphoric acid ( $\text{H}_3\text{PO}_4$ ) does not present the problems of residual iron staining as does oxalic acid (or hydrochloric acid, discussed below), it is a relatively slow-acting compound, although, it can be heated in a crockpot to speed the process. Overheating a relatively concentrated solution can result in polymerization as a polyphosphate (this happened once when the thermostat on a crockpot shorted out causing a runaway temperature), necessitating discarding the crockpot and its contents as an inseparable solid mass. Phosphoric acid is an oily compound in concentrated form (reagent grade is 85%  $\text{H}_3\text{PO}_4$ ), and when not properly neutralized it will bleed out of the mineral. I once purchased a nice specimen composed of a spessartine crystal on microcline (from Pakistan) some years back, and placed the specimen on its label in a fabric-lined display case. When I next examined it, I discovered that the acid had never been neutralized, and had thus eaten a hole through the label and underlying fabric!

### Hydrochloric Acid.

Pure hydrochloric acid (HCl) is a water-soluble gas. Reagent grade hydrochloric acid is 37% HCL, whereas muriatic acid (as purchased from a hardware store) contains *ca.* 20–30% HCl. Concentrated HCl gives off copious fumes, and must be therefore handled with adequate ventilation. Work with HCl must be done only in vessels with lids to minimize fumes, which are highly corrosive to any nearby metal. Its small molecular size and high hydrogen ion activity gives HCl good penetration and quick action for mineral cleaning. It easily removes various hydrous Fe- and Mn-bearing oxides as well as hematite. However, it leaves a Fe-chloride residue that must be removed with multiple cleaning in dilute oxalic acid followed by a final cleaning in dilute phosphoric acid. And since HCl penetrates quite deeply into porous minerals, it can

become quite a prolonged process to get it all out. If not properly neutralized, as a gas it will evolve from the mineral and attack whatever's around it, especially your prized marcasite specimens. It can also fog the glass inside a cabinet where the incompletely cleaned mineral resides. Generally I avoid using HCl unless there is a particularly heavy encrustation of oxides or recalcitrant hematite. Having said that, dilute solutions are quite useful for dissolving unwanted carbonates from matrix specimens.

The concentrated acid needs to be handled with respect; in one laboratory incident I am aware of, a glass bottle of reagent-grade HCl fell from an upper shelf and broke on the floor, covering the lower half of a laboratory worker's leg. Even though he rinsed and neutralized the acid immediately, he nonetheless sustained second-degree burns. Needless to say, laboratory protocol was subsequently changed to prohibit glass acid bottles from being stored overhead.

Note: I have found that overuse of concentrated HCl in amazonite (to remove heavy specular hematite or extract internal Fe-oxides in porous specimens) can indeed bleach the blue-green color, even though it's a silicate mineral and ostensibly insoluble.

#### Hydrofluoric Acid.

Hydrofluoric acid (HF) is among the most treacherous compounds I've used; ***no description could possibly convey the treacherous nature of this acid!*** It is best avoided if at all possible. Even a small drop on the skin will immediately penetrate and cause severe and painful burns. Immediate application of a calcium gluconate gel (2.5%) will mitigate these effects, but most mineral collectors will not have this at hand, and even if so, it has a short expiration date. Even that would not save you if your skin was exposed to only 25 square inches of the concentrated acid; the result will be fatal due to rapid and deep penetration and resulting Ca-electrolytic imbalance; once thusly exposed, ***nothing*** can save you from an excruciating death! I'd prefer working with nerve or mustard gas (which I've also done).

Having stated the aforementioned, HF is uniquely useful for cleaning some minerals in that it dissolves silicates; nothing else can do this job. Its exceptional penetrating ability allows it to remove iron stains from even deep minute fractures in relatively insoluble minerals, such as fluorite, sulfides, sulfates, and some silicates that are only slowly etched (e.g., diopside, garnet, epidote, and zircon). The chemical activity of HF for dissolving silica rapidly diminishes, so it needs to be replenished after a short time, even though it remains a potent and dangerous acid. I have found paraffin to be useful to mask silicates from the effects of HF while cleaning associated acid-resistant species.

As with HCl, HF is a gas that is dissolved in aqueous medium to a concentration of 36-38% in reagent grade. Because it attacks both silicates and glass, it is sold in heavy-duty plastic bottles. All vessels used for cleaning need to be plastic with tight-fitting lids to minimize exposure to fumes. Because of the extreme toxicity of HF fumes, and its restricted use to plasticware, it must not be heated. Neutralization of the specimen after cleaning is absolutely mandatory! I have seen a home with a kitchen window near the sink that was quite frosted from nearby use of this acid.

#### Sodium Dithionite.

This compound is useful for cleaning acid-soluble carbonates. It cleans by reducing iron to a soluble divalent state. It is composed of a mixture of Na-dithionite ( $\text{Na}_2\text{S}_2\text{O}_6 \cdot 2\text{H}_2\text{O}$ ) that reduces trivalent Fe to water-soluble divalent Fe, Na-citrate that is a chelating agent for Fe, and Na-bicarbonate that is added to attain a pH neutral solution that will not attack carbonates. It has a short shelf life once an aqueous mixture is prepared, and cannot be heated as sulfur dioxide ( $\text{SO}_2$ ) evolves. Its use is now largely supplanted by commercially available Super Iron Out.

#### Super Iron Out.

This commercially manufactured compound has only relatively recently come into common use; it is marketed as a “rust and stain remover”. Although it is advertised to be suitable for “toilets, sinks, tubs”, *etc.*, mineral collectors quickly adapted it to cleaning their specimens. It is similar in action to Na-dithionite, composed of a mixture of Na-bisulfite and Na-hydrosulfite that works by rendering Fe into a soluble divalent state once dissolved in water; like Na dithionite, Iron Out also has a short shelf life once mixed. It is useful for cleaning matrix specimens that contain minerals that are soluble in HCl or oxalic acid, such as fluorite, which would be quickly attacked by either.

I use oxalic acid most of the time because I can heat it in a crockpot; Iron Out cannot be heated as evolution of sulfur dioxide (SO<sub>2</sub>) will commence, creating a distinctly malodorous environment; it must be used at low or room temperatures with a lid. Accordingly, oxalic acid with heat is much faster acting than Iron Out (or Na-dithionite) at room temperature. Having said that, my recent experiences with Iron Out have been favorable, noting that it can take a much longer time to get the job done. But like phosphoric acid, it can be quite effective in cleaning matrix specimens. Moreover, it does not leave residual yellow Fe-bearing compounds behind as do HCl and oxalic acid. Joe Dorris provides helpful guidelines and comments on using Iron Out for cleaning pegmatite minerals on his web page; note especially his comment on the need to periodically refresh Iron Out solutions.

### **Neutralizing Compounds**

#### Sodium bicarbonate.

It is readily available as baking soda and is efficient. I use it most of the time. On a related note, Mallinkrodt manufactures a commercial “Neutralizer for Acids” formulation that contains sodium carbonate. I haven’t tried this on minerals. One can also obtain sodium carbonate at the grocery store as “washing soda.”

#### Ammonium Hydroxide.

I am informed that a dilute solution of ammonium hydroxide is very effective in neutralizing acids and tends not to leave residual Fe stains. Its smaller molecular size (compared to Na-bicarbonate) should allow it to penetrate fractures and porous matrix faster and deeper. It’s not a chemical found in the average kitchen, however, and obtaining it commercially could be problematic, especially as it is an ingredient in drug manufacture. NH<sub>4</sub>OH is a water-soluble gas that is dissolved in aqueous medium; a concentrated reagent grade is 57.6 % NH<sub>4</sub>Cl with very potent fumes!

### **Miscellaneous Cleaning Chemicals**

#### Sodium Hypochlorite (aka laundry bleach).

I have used this with some success for cleaning organic material from delicate minerals such as thomsonite where harsher chemical or physical methods cannot be employed.

#### Sulfuric Acid.

This chemical, H<sub>2</sub>SO<sub>4</sub>, is not too useful except maybe for attacking organic material and facilitating its removal. A large amount of exothermic heat evolves when it is diluted with water, so due caution must be used when rinsing a specimen, especially heat sensitive ones.



Sulfuric acid is a viscous liquid that is *ca.* 98% pure in reagent grade. It requires far more respect than even HCl. A concentrated solution left in the open will absorb atmospheric water until it reaches 52%, in which case, if the vessel was near full to begin with, **it** will overflow. Because of the extreme exothermic heat given off when the concentrated acid is diluted, it must be diluted by adding acid to water with mixing. Although one can often get away without following this protocol for diluting other acids, this is not the case with sulfuric acid! I've witnessed what goes wrong when this protocol is not followed when a laboratory technician had attempted to dilute the acid by pouring the concentrated acid into a beaker, then adding water. Since the acid has a higher specific gravity than water, the water formed an unstable layer on top of the acid. Dropping a stirring rod through the water-acid interface in the beaker broke the meniscus, causing a literal and immediate explosion of concentrated sulfuric acid and water. Luckily this happened in a glass-enclosed fume hood.

## **Mechanical Cleaning Aids**

### High-pressure water gun.

This equipment was originally designed for dry cleaning, and adopted by mineral collectors. They are made by various manufacturers, including Krebs (Swiss) and various other firms (Albatross *et al.*). The high-pressure water jet delivered by this equipment constitutes an efficient and cost-effective means of removing a lot of extraneous dirt and caliche from minerals; it is very useful for pre-cleaning before acid treatment. I have found that failure to clean (dry) the internal workings after each use can lead to difficulties in getting it fired up again. The piston rod also needs to be lubricated periodically.

### Micro-abrasives.

Introduced to the mineral world by fossil preparators, this equipment was used to efficiently remove shale and other matrix from an enclosed fossil. It is essentially a small-aperture nozzle that delivers a fine spray of abrasive micro-beads under pressure from a compressor. It is a messy process unless confined in a vacuum glove box! I find glass beads to be the most useful abrasive, with occasional uses for a much softer sodium bicarbonate. This equipment is far more effective than a water gun, as it will remove much heavier and more recalcitrant coatings of caliche or other insoluble residues coating minerals; I hate to think of the minerals I parted with many years ago, before micro-abrasives came into being, on account of coatings that were otherwise not removable. Abrasives must be used with caution to ensure the mineral surface will not be altered. Use a rubber glove (*e.g.*, Playtex) at least on the hand holding the specimen when working with this equipment! If you like your compressor, open the valve at the bottom of the tank after each use to allow water to drain; otherwise it will corrode the inside of the tank.

The equipment can be purchased from a number of paleo dealers, but sometimes more cost effective apparatus can be procured from Harbor Freight and Tools if one is willing to do some modification and fabrication.

## **Trimming**

Since we're on the topic of mineral preparation, I might as well briefly discuss trimming. The most useful appliance I have is a water-cooled, 14-inch diamond saw (made for cutting tile). I use this now much more than even the Zuber (or Chinese made) hydraulic trimmers. If all that's available is an oil-cooled lapidary saw, it will get the job done, but thoroughly soak the mineral in water before proceeding to prevent oil from being absorbed into the matrix, then clean it thoroughly in soapy water afterwards. Water-soluble oils are commercially available for lapidary saws; although I haven't used them, they should reduce or eliminate the oily residue of ordinary lapidary lubricants (such as Almag, *etc.*),

although I presume their lubricating and cooling qualities, especially when cutting harder materials such as quartz and chalcedony, will be diminished. Diamond saw blades are manufactured to accommodate different hardnesses of materials, so choose a blade that will work for your average specimen; this is more art than science, I think.

Carbide-tipped micro-engravers will trim and remove matrix that nothing else will; it is used with a compressor. The less powerful engravers seem to create more problems than they solve; buy a commercial-grade unit. And don't forget to add a drop of oil to the air hose from time to time. This tool is best used in a glove box to prevent silica (or whatever) dust from permeating the room.

## References

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Kile, D.E., and Wilson, W.E. (1997). Mineral specimen repair and restoration: An attitude check. *The Mineralogical Record*, v. 28, p. 82-84.

Pearl, R.M. (1982). *Cleaning and Preserving Minerals*, 5<sup>th</sup> edition, Earth Science Publishing Company, Colorado Springs, 87 pp.

Sinkankas, John (1972). *Gemstone and Mineral Data Book*, Winchester Press, New York, 352 pp.

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# FRIENDS OF MINERALOGY, INC.

## Midwest Chapter

### APPLICATION FOR MEMBERSHIP

### MEMBER DATA SHEET

Please fill in this application and mail it along with your check to the address listed at the bottom.

Name \_\_\_\_\_  
Last First Middle Initial

Address \_\_\_\_\_  
Street City or Town

State Zip/Postal Code

Telephone Number \_\_\_\_\_ (Home) \_\_\_\_\_ (Office/cell)

E-mail address \_\_\_\_\_

Would you be willing to serve as an officer or committee member/chair? \_\_\_\_\_

I affirm that I support the purposes\* of Friends of Mineralogy:

Signature \_\_\_\_\_ Date \_\_\_\_\_

Friends of Mineralogy, Inc. is composed of the members of 7 local chapters, plus national members not affiliated with a chapter. **Prospective Midwest Chapter members should send this completed application and \$20.00/year dues to:**

**Jeff Spencer, Treasurer**  
**Friends of Mineralogy, Midwest Chapter**  
**4948 Beachwood Dr., Cincinnati, Ohio 45244**

- \*1. To promote interest in and knowledge of mineralogy.
- 2. To advance mineralogical education.
- 3. To protect and preserve mineral specimens and promote conservation of mineral localities.
- 4. To further cooperation between amateur and professional and encourage collection of minerals for educational value.
- 5. To support publications about mineralogy and about the programs of kindred organizations.





## Friends of Mineralogy Midwest Chapter Field Trip Waiver/Hold Harmless Agreement

1.0 I, \_\_\_\_\_, desire to participate in Friends of Mineralogy Inc. Midwest Chapter ("FMMC")

(please print full name of participant)

field trips/activities ("Activity"). I fully understand and appreciate the dangers, hazards and risks inherent during any Activity, in the transportation to and from the Activity, and in any independent research or activities I undertake as an adjunct to the Activity, which dangers include but are not limited to serious and mortal injuries and property damage.

2.0 Knowing the dangers, hazards, and risks of such Activity and research, and in consideration of being permitted to participate in the Activity and research, on behalf of myself, my family, heirs, assigns, my estate and anyone claiming through me, release waive, forever discharge and covenant not to sue FMMC, it's officers, directors, members, agents or third parties (hereafter called the "Releasees") connected with the FMMC Activity of any and all claims, loss, injury, damage, demands, actions, causes of action, costs, and expense of every nature, known or unknown for damage to personal property, personal injury, death, as well as any emotional or psychological harm, or damages or loss of reputation, employment, contract, property rights and due process.

I further agree to assume all the risks and responsibilities known or unknown surrounding my participation in the Activity, including transportation to or from, or any independent research or activities undertaken as an adjunct thereto. I understand the activities have inherent risks and I understand those risks and assume responsibility to protect myself from those risks and acknowledge that FMMC cannot foresee all risks and hazards.

3.0 I understand and agree that Releasees do not have medical personnel available at the location of the Activity. I understand and agree that Releasees are granted permission to authorize emergency medical treatment if necessary, and that such action by Releasees shall be subject to the terms of this agreement. I understand and agree that Releasees assume no responsibility for any injury or damage which might arise out of or in connection with such authorized emergency medical treatment.

4.0 In signing this Release, I acknowledge and represent that I have fully informed myself of the content of the foregoing waiver of liability and hold harmless agreement by reading it before I sign it, and I understand that I sign this document as my own free act and deed; no oral representations, statements, or inducements, apart from the foregoing written statement have been made. I understand that the corporation (FMMC) does not require me to participate in this Activity, but I want to do so, despite the possible dangers and risks and despite this Release. I further state that I am at least eighteen (18) years of age, and fully competent to sign this Agreement – and that I execute this Release for full, adequate, and complete consideration fully intending to be bound by the same. I further state that there are no health-related reasons or problems which preclude or restrict my participation in the Activity, and that I have adequate health insurance to provide and pay for any medical costs that may be attendant as a result of injury to me.

5.0 I further agree that this Release is in effect in perpetuity once executed, unless revoked in writing and shall be construed in accordance with the laws of the state in which FMMC is incorporated, Ohio. If any term of this provision of this Release shall be held illegal, unenforceable, or in conflict with any law governing this Release, the validity of the remaining portions shall not be affected thereby.

IN WITNESS WHEREOF, I have executed this Release this \_\_\_\_ day of the month of \_\_\_\_\_, 20\_\_\_\_.

**Participant Signature:** \_\_\_\_\_

**Address:** \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

**Street**

**City**

**State**

**Zip Code**

**Phone (with area code):** \_\_\_\_\_ **email:** \_\_\_\_\_

**Emergency Contact:** \_\_\_\_\_ **Phone (with area code):** \_\_\_\_\_

**Witness Signature (must be at least 18 years old):** \_\_\_\_\_

## January 10<sup>th</sup> Wittenberg Meeting Directions:

The event will be in Building 22 on the attached map - Barbara Deer Kuss Science Center, basement Level. The site is located at the junction of Bill Edwards drive and North Plum Street.

Park in the free lot just north of the building, east of Plum St.



### ALPHABETICAL

Admission 19  
Alpha Delta Pi 55  
Barbara Deer Kuss Science Center 22  
Bayley Alumni House 29  
Bayley Auditorium 22  
Bayley-Diehl House 11  
Benham-Pence Student Center 42  
Benjamin Prince House 12  
Beta Theta Pi 53  
Betty Dillahun Field 50  
Bill Edwards Field 50  
Blair Hall 30  
Bookstore 42  
Campus Ministries House 8  
Carleton Davidson Stadium 54  
Career Services 44  
Carnegie Hall 16  
Chakeres Memorial Theatre 40  
Chapel Lawn 34  
Commencement Hollow 17  
Community Service 43  
David B. and Georgiana S. Albright Tennis Complex 49  
Delta Gamma 3

Doppelgängers 42  
Edwards-Maurer Field 52  
Ferncliff Hall 10  
Firestone Hall 36  
Foreign Language Learning Center 28  
Founders 42  
Fountain 24  
Gamma Phi Beta 14  
Health and Counseling 44  
Health, Physical Education and Recreation Center 51  
Hollenbeck Hall 28  
International Education / Study Abroad 28  
Joseph C. Shouvin Center 44  
Kappa Delta 9  
Keller Place Apartments 6  
Kissell Auditorium 20  
Koch Hall 20  
Krieg Hall 15  
Math Workshop 22  
Matthies Honors House 38  
Morris J. Knauss Greens Student Residences 13  
Motor Pool 18  
Myers Hall 26

Myers Hollow 27  
Ness Family Auditorium 28  
New Residence Hall 46  
Oral Communication Center 35  
Pam Evans Smith Arena 51  
Phi Gamma Delta 7  
Phi Kappa Psi 5  
Physical Plant Building 1  
Police Division 18  
Polis House 47  
Post 95 42  
Recitation Hall 19  
Recitation Hall Annex 18  
Seal 25  
Sigma Kappa 48  
Solution Center 35  
Sprecher Place Apartments 4  
Springfield Center for the Arts at Wittenberg University 2  
Stoughton Lawn 45  
Student Development / Dietrich House 37  
Susan Hirt Hagen Center for Civic & Urban Engagement 43  
Synod Hall 32  
Thomas Library 35  
Tower Hall 41

Weaver Chapel 31  
Weaver Observatory 21  
Woodlawn Hall 33  
William A. McClain Black Culture House 39  
Writing Center 28  
Zimmerman Hall 23

### NUMERICAL

1 Physical Plant  
225 N. Fountain Ave.  
2 Springfield Center for the Arts at Wittenberg University  
3 Delta Gamma  
4 Sprecher Place Apartments  
5 Phi Kappa Psi  
6 Keller Place Apartments  
7 Phi Gamma Delta  
8 Campus Ministries House  
9 Kappa Delta  
10 Ferncliff Hall  
11 Bayley-Diehl House  
12 Benjamin Prince House  
13 Morris J. Knauss Greens Student Residences  
14 Gamma Phi Beta  
15 Krieg Hall

16 Carnegie Hall  
17 Commencement Hollow  
18 Recitation Hall Annex  
19 Recitation Hall  
20 Koch Hall  
21 Weaver Observatory  
22 Barbara Deer Kuss Science Center  
23 Zimmerman Hall  
24 Fountain  
25 Seal  
26 Myers Hall  
27 Myers Hollow  
28 Hollenbeck Hall  
29 Bayley Alumni House  
30 Blair Hall  
31 Weaver Chapel  
32 Synod Hall  
33 Woodlawn Hall  
34 Chapel Lawn  
35 Thomas Library  
36 Firestone Hall  
37 Student Development / Dietrich House  
38 Matthies Honors House  
39 William A. McClain Black Culture House

40 Chakeres Memorial Theatre  
41 Tower Hall  
42 Benham-Pence Student Center  
43 Susan Hirt Hagen Center for Civic & Urban Engagement  
44 Joseph C. Shouvin Center  
45 Stoughton Lawn  
46 New Residence Hall  
47 Polis House  
48 Sigma Kappa  
49 David B. and Georgiana S. Albright Tennis Complex  
50 Betty Dillahun Field / Bill Edwards Field  
51 Health, Physical Education and Recreation Center  
52 Edwards-Maurer Field  
53 Beta Theta Pi  
54 Carleton Davidson Stadium  
1101 Mitchell Blvd.  
55 Alpha Delta Pi  
  
200 W Ward St  
Springfield, OH 45504  
www.wittenberg.edu  
(937) 327-6231



Indiana State Museum  
650 West Washington St.  
Indianapolis, IN 46204

**SATURDAY**

**February 21**

**2015**

**10:00 AM - 5:00 PM**

## **GeoFest**

Buy jewelry, fossils, cut and uncut gemstones and minerals from all over the world. Enjoy hands-on geology activities and win geo-prizes. Meet geo-experts from all over the state. Explore the museum's three natural history galleries. GeoFest is included with museum admission.

Interested in being a vendor? Contact Peggy Fisherkeller at 317.232.7172 or [pfisherkeller@indianamuseum.org](mailto:pfisherkeller@indianamuseum.org)

In partnership with



Our Chapter will be present at GeoFest 2015 on Saturday, February 21 from 10:00-5:00 PM. John Davis and Randy Marsh will have a table set up at the event with information about our Chapter, membership applications, and a selection of minerals collected in the Midwest.