

CHEM 820P (Inorganic Chemistry for High School Teachers I) – Module 4 Discussion Board

In your school lab, what is the biggest chemical storage/handling/disposal challenge you face? How does this impact your class' current lab activities and your potential to develop new lab activities?

For southern Indiana, the biggest problem we face is disposal cost. In the past, we have kept a box in the chemical "closet" and have put all of the old chemicals in there. We ended up with many bottles stacked up with no place to go. We called a chemical disposal company and they wanted to charge us \$400 to dispose of the chemicals. The school couldn't afford to disposed of the unneeded chemicals so they say there for another 4 years.

I had the opportunity to apply for a grant for waste disposal and applied. We were granted this opportunity and were able to dispose of our wastes....free. We now have a box is beginning to fill again. Again, we now have the issue of how we are going to pay to dispose of our chemical wastes. Some of our administrators act as if throwing the bottles in our trash cans on various occasions will take care of our problems....? I know what is right, but , as most schools do, all of our issues come down to money!

This is a really fun topic. Central has had two BIG storage issues. first in 1979 (okay not yesterday, but I was at least born when this happened.) the shelves in the flammable cabinet collapsed. I have been told the bolts holding the shelves were weakened (by acid vapors or something) and over lunch when no one was in the room the shelves clapped and started a big fire that consumed the entire room.

The other issue we had was when I first got there we were undergoing renovation and had to move all the chemical storage stuff around several times -which really helped me understand how to store chemicals. The department head for science had been lazy for years and never bothered to see what chemicals they actually needed so we had 30 + two liter bottles of con. sulfuric, nitric, hydrochloric acid. Oh ya and they were stored in the same closet as con ammonium hydroxide. We had to wipe the white coating off of everything as we moved stuff. We were able to call district office and sent bottles to many other school so they could have some and we could be safer.

I think the main problem with waste disposal is new teachers. As they (we as of four years ago) come in they don't really know what needs to be saved and what can go down the drain safely. There is also not a great system in place for them to go and check on chemicals easily. MSDS works fine, but they are hard to track down and time consuming to dig through. We have enough teachers around so people can ask, but in a small school it has to be a pain.

I forgot to answer the last question....It keeps me from doing labs if I know I am going to have to find places to put all of the wastes. We are in a small school and have little storage space. We seem to use the same chemicals and the do same experiments on a yearly basis.

Storage and disposal is one of the aspects of teaching that I do not enjoy. When I inherited my classroom, my school had recently (within the previous 5 years) done a chemical clean up and rid the closet of most of the "nasty" stuff. However, in the next years, the former teacher had lab set-ups and disposals that were not well labeled. I walked into a storage closet with lab tubs labeled "lab #38" without any incling as to what lab #38 was or what was in the bottles. There were also two large glass jugs - one labeled "recovered organic solvents" and the other "recovered heavy metals" - do I know what exactly is in them? NO!

As a first-time teacher, I hate to admit, but, chemical storage was way at the bottom of the list of things to be prepared for compared to lesson plans, handouts, activities, etc. In the three years I was at this school, I did nothing with those mystery bottles. I did make sure that the solutions I mixed were much better labeled, including the date, formula, chemical name, concentration, and who made it. There is a dramatic difference in the latter and former containers.

I just handed the classroom over to another first-time teacher. He was instantly motivated to work on the storage and disposal issues at our school. There has been a new ventilation system added to the chemical closet, chemicals disposed of properly, and chemicals that will now be stored safer. Our school has backed up what is being done 100%, which has always been great about this school.

I know that during the ordering process, since I was the only teacher in the district, it made keeping track of wat was there much easier. I also kept a running list of supplies to order hanging in the chemical room so I could remind myself each spring what needed ordered. In terms of how storage and disposal limited me, I know I would steer clear of labs that had lenghtly or complicated disposal processes. I am very for the students doing as much of this as possible and chose labs that they could dispose of on their own (mostly down the sink or in the trash can). Other solvents (ex: ethanol) were left to evaporate. I use the FLINN catalog as my primary reference for storage and disposal; their techniques are thorough and relatively easy to follow. I also worked on updating the MSDS reference book for all of the chemicals in the classroom. My student aid did a fabulous job of finding and printing them - that put us one step closer for the new teacher as he re-organized.

I don't know exactly what type of chemical situation I am getting myself into at my new school. I will only be teaching 7-8th graders, so I'm thinking there (hopefully) won't be as much to worry about!

I've had the privilege of working at three different schools with three different chemistry departments and got the opportunity to see how different schools go about storage/handling/disposal. The first two schools were in Fort Collins, CO while the other is my current school in Omaha, NE.

The first school in Fort Collins had been around for close to 100 years but they moved into a new building 5 years before I worked there under a temporarily basis for a teacher out on maternity leave. It was obvious the department did a major clean before transferring from the old to new building. My department head was very diligent about keeping everything clean and orderly and was very good at keeping me abreast of where items should be disposed.

The second school I worked at in Fort Collins was in its second year of existence. Being a brand new school with a huge budget and completely new everything and a very diligent department head meant that everything was handled perfectly. He demanded absolutely cleanliness of the prep room and made sure that everything was always up to code. Furthermore, we had very little waste being around for just one year before I was hired.

My current situation is very different. My school has been around for close to 100 years and at the same location for 55. Though the science wing opened just six years ago, the department decided to just transfer everything down without doing any type of organization or cleaning. Our chemistry stockroom is chuck full of stuff many of it older then the Nixon administration. Furthermore, our chemistry head teacher refuses to toss anything out. Consequently, we have duplicates of almost every chemical including known carcinogens. Case in point, I was doing a demo where I needed potassium metal. I found 7 cans of potassium and 5 of those are empty. Why you would save a can with the oil the potassium comes in is beyond me. The physical science group has become so frustrated they no longer store chemicals back there which is even more hazardous since now you have magnesium ribbon just sitting on a shelf in the general stockroom.

My coworker extends his behavior to even classroom items. The room I inherited had binders from 15 years prior. I went through them and tossed them and they magically showed up in our office. This happens when any staff member throws away anything chemistry related; it reappears a few days later. I have had to literally resort to covert tactics to throw out stuff including tossing things late at night, coordinating with custodians or even hauling things back to my house and disposing of them there.

I have brought up my concerns with my department head but he feels our stockroom is managed decently. Basically, I'm waiting for my chemistry head to retire then I'm going to redo the entire stockroom including disposal to make it a viable and useful area.

I think our biggest problem at St. Paul is what to do with old chemicals. When I arrived at St. Paul four years ago, there was a ton of old chemicals that were dated in the sixties and later. Needless to say, they were outdated and needed to be disposed of. Many of the chemicals weren't stored properly, and had a lot of reactions happening causing a very big mess. So we

have finally been able to requisition for closets/containers that we can separate the acids from the rest. We have a locked closet for acids and another for alcohols. But we still have a lot of old chemicals that need to be disposed of and many others that should be stored differently but we need storage space for them.

Since I have not had a chemistry class yet, and I've had very few chemical labs with my classes and waste disposal has not been an issue for me yet, my first and biggest challenge ahead lies in chemical storage. I will be teaching in a new school to me, new classroom and new chemical storage closet. I plan to involve my students in discovering, identifying and dating the chemicals. We will build our own chemical chart including safety data on each chemical, and dispose of outdated chemicals. Then when we use any chemicals in a lab the student who catalogues the chemical will share the properties and safety guidelines with the class. Iowa also has Rehab the Lab and I hope the school I am going to is involved or that I can get them involved. Also I think I know myself good enough to know if the disposal of waste is going to be difficult I won't probably do the lab:)

My current problem does not seem to be what to do with what I order for activities because I know I will use those chemicals and disposal of those chemicals can easily be looked up in Flinn. The monkey on my back is what I am going to do with all of these chemicals I inherited from the previous teacher. A secondary problem I have is finding enough time to keep everything organized.

When I came to my school, the previous teacher was a "keeper" and a "kit builder". So I had a lot of work in front me. The science room has moved twice in my eight years here to my current brand new location as of the Fall, 2003. So I have made time to go through, organize, and throw away a lot of supplies that were not well cared for or were simply trash as well as dispose of some problem chemicals. I also have organized all my chemicals according to Flinn's directions. (Flinn was also very helpful to me when they built my new science room and the builders didn't know any of the laws.) But I am the only one person, and as much as I would like my job to be science supply management, I have four preps and six classes I have to teach everyday. So much of the time, management of supplies falls to the back burner.

Sometimes I hear about teachers who include their students in organizing the chemical storage room. That is very scary for me personally. What kind of liability are you opening yourself up to by allowing or maybe even requiring students to handle some unknown potentially harmful chemicals? I don't think using students or even a student aid in chemical management is a well thought out plan. I also don't think student should know exactly what is in the school's chemical storeroom. If they don't know it is there, they can't try to steal it.

So what is my point here...

With the current shortage of science teachers, I think it would be prudent if you were an incoming teacher at a small school where there are three or less science teachers to take a good hard look at the storage room and chemicals that are there. If the storage room is a mess and

you want the job, I would tell them that you would love to have this job but you will to have some extra paid time to clean up the storage room because it is unsafe. I am sure some of you are saying I would do it anyway whether I was paid or not. The simple fact is that there is a liability problem. If the school is not paying you and there is an accident, then the school has a major problem. AND if you could get five or six extra days added onto you teaching contract for science supply management, you would be well ahead of the rest of us. This is a good solution to circumventing the laws that no longer allow schools to deviate from their master contract (i.e. give a signing bonus) here in the state of Nebraska.

Well, in my lab I don't really deal with chemical disposal. The department chair, who is also a chemistry instructor deals with that. So I really don't know what the biggest concern is. However...I do not think the chemicals are being disposed of properly, or stored properly for that matter. I will have to read the disposal and storage supplements more carefully. In the past I know that our chair has just taken some of the chemicals that should not be poured down the drain and just poured them outside in the dirt...which can't be safe. Also, our storage room is organized alphabetically by anion. The acids are in their own cabinet, as are the alcohols/bases. The metals are on their own shelving unit, about 3-4 feet across from the sulfates and the "end of the alphabet" anions. Indicators and miscellaneous substances are located 3-4 across from the "beginning of the alphabet" anions. And the hydrogen peroxide (30%) is in a brown bottle (sometimes in a bag if it hasn't been used yet) on top of that shelf.

The biggest storage problem I face is balancing safety v cost. I know we should only keep on hand a two to three year supply of chemicals but the chemical supply houses offer huge discounts on the larger quantities. The difference between 500 g bottle and a 2 kg bottle can be as much as half the price per gram for the larger size. Since my budget is tight I will order the larger size even though that may last me ten or more years.

Like everyone else, I have the problem of inherited chemicals that I can't afford to get rid of so they just sit in the storeroom. I was contacted recently by the state about a grant they had to remove these unwanted chemicals. I filled out a lot of paperwork but as yet nothing has happened. My understanding is that the funds were limited and they prioritized the problems and acted till the funds ran out. Since we are a single private school, we are way down on the list compared to the larger school districts who district wide have a much larger volume of material to dispose of.

One recent development that I find interesting is the increased monitoring by our insurance company. The fire inspector comes out once a year comes three feet inside my room looks around and declares everything looks okay and I don't see him again until next year. He has never even looked in my storeroom to see what was in there and how it was stored. That's been the rule for twenty years. Recently however the insurance company has been giving us very thorough inspections. We've done okay but they are very concerned about storage. They haven't had much to say about what chemicals we have on hand but that may be coming.

I have recently become department chair for my school's science department. I have to be

honest that as a "regular" teacher, I made sure that my practices were professional and ethical but gave little attention to the other teachers around me. There is little education or training in undergrad or professional development that informs science teachers of best practice. One person in a department cannot be responsible for all activity in that department--or so I thought. Our last department chair spent little or no time on chemical storage/handling/disposal. As both a chemistry teacher and department chair, I plan to be much more proactive to ensure that the administration as well as the science staff recognize their responsibility in ensuring safe practices.

Thread: High School Chemical Cleanup Program in Development

Post: [High School Chemical Cleanup Program in Development](#)

Author: Christopher Exstrom

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Everyone,

I appreciate you sharing your chemical storage/disposal situations. Your stories confirm my (and others') impression of the state of chemicals and their storage in high school chemistry labs across the country.

I am going to send you an e-mail about this, but I'll also post it here. I work with the non-profit group Keep Nebraska Beautiful and am on the steering committee for the development of a Nebraska statewide high school chemical cleanup program. Our primary concern is high school chemistry labs but the program will eventually spread to art, building maintenance, and other areas that routinely use, store and dispose of chemicals.

Our program will include training for both in- and pre-service teachers as well as assistance in evaluating chemical storage hazards and arranging for waste disposal. We've been working to get EPA grant funding to get our program off the ground. You may hear from us at this Fall's NATS meeting -- October 25-27, Fremont, NE.

Jim Woodward, the Science Curriculum Director of the Nebraska State Department of Education, is also on the steering committee and will lead the implementation of the program. As things get rolling, you will definitely hear more!

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