

Welcome to the Wonderful World of Waste Michael Pola , Envirostore Chemical Consulting

Here we go again with more commentary on waste matters various. This article is on the so called Prohibited and Restricted Chemicals in schools. Applicable to Department of Education and Training Department schools , although it should apply to the rest of the school world.

We have been publishing our own list of banned chemicals for school labs for some years now, the list is on our web site for all to see and each time I do a Labcon or STAV talk to all you lab technicians I make mention to it. My list is a personal list, not official by any means and is made up of chemicals that in my opinion, should not be present or used in a school laboratory. The main reason is of course , apart from the nasty and filthy nature of some of these chemicals, but because your students doing pracs have little to no experience working in a laboratory environment let alone using and being exposed to some of these chemicals.

The Department does publish its own list, entitled Guidance Sheet 3: Prohibited and Restricted Chemicals, which apparently was last updated on July 2018. This guidance sheet also mentions ammonium nitrate , which is classified as a High Consequence Dangerous Goods ( HCDG) but so long as you store no more than 3 kg for educational purposes and it is stored in a secure store and you have set up a system to keep track of each and every usage of ammonium nitrate and it is kept under lock and key, the school does not need to obtain a HCDG licence.

The Departments Guidance Sheet 3 also makes mention of the Scheduled Carcinogenic Substances made up of two schedules, the Prohibited Carcinogens and the Notifiable Carcinogens. Both schedules require a licence and or notification from Worksafe Victoria to be able to use . The second schedule is just a notification.

Looking at both these lists shows only the three common types of asbestos and benzene as virtually the only chemicals you might encounter in the school lab. The Prohibited list has the brown and blue asbestos ( amosite and crocidolite respectively) and the notifiable list has white asbestos aka chrysotile. The rest of the chemicals on both lists would be unknown in the school laboratory .

If you have mineral samples in the school lab containing asbestos, you do not need to have a licence or notification unless you wish to hang onto the asbestos and only if it is blue or brown,.White asbestos is on the notification list. If you have any of these you may wish to dispose and replace with embedded samples ( ie in perspex or similar) which render the mineral harmless. Most of you have elected to dispose . Other forms of asbestos are the asbestos mats and heating mats which may or may not contain asbestos., depends how old they are. If in doubt dispose and replace with new which will not have any asbestos. Benzene and other aromatic solvents such as toluene and xylene also appear on my list as not recommended and I haven't seen these at any schools for some time.

The Departments list is a fairly modest one compared to mine although mine is due for an update to add in the soluble heavy metal salts of lead, cobalt ,mercury and cadmium if they aren't already present. Also chrome VI salts ( ie dichromates and chromic acid) seem to be increasingly out of favour; chrome III, ie chromates not so. Any chrome salt which is green will be chrome III, yellow, orange and deep red are chrome VI and are reportedly soon to make their debut on the human carcinogen list. They are very poisonous also.

The chemicals in common to both the Departments list and mine include our old favourite hydrofluoric acid, carbon disulphide, the chlorinated solvents carbon tetrachloride , chloroform and dichloroethane. I don't know why white phosphorous didn't make the team , it should be the captain, coach and main sponsor . No mercury , elemental or salts either.

At the end of the day, entry of anything on either list does indicate there is something to be wary about due to ( part from the carcinogens) high reactivity , high toxicity, an ozone or green house antagonist, or simply out and out danger such as the HF and white P, and certainly not safe in the hands of inexperienced school kids even year 12 chemistry students . There are plenty of other chemicals available to demonstrate chemical principles and reactions without resorting to taking a piece of phosphorous out to the school oval to show what happens when it is exposed to air, or throwing a piece of potassium or sodium into a bucket of water. What fun , but tell me what

the kiddos have learnt other than the identity of some chemical they might take in interest in out of hours.

I have always thought it a good chemistry prac. to identify an unlabelled chemical. I know you occasionally have jars in the store that the label has fallen off. Give a sample to the class and ask them the steps they would go about identifying the contents. Start off with something simple like sodium chloride or potassium chloride. Flame test and chloride test using silver nitrate will work .

The other day we were presented with a drum purportedly containing hydrofluoric acid. You can imagine my joy. However it is always worth confirming that it actually is HF. When we opened the bung there was a bit of white fumes which is not always the case with mid strength HF. Hydrochloric acid was suspected . What steps do you think I should take too see if is HF or HCl ?

I'll tell you next article but this is day to day work of a waste chemist in the big wide world of chemical waste.

The new and "improved" EPA waste cert system is being rolled out as we speak and it is even more imperative that you register your school as a waste disposer. New EPA Act and associated regulations come into force 1/7/21

You can contact myself with any comments on the above or Sam Gunning the Lablines editor in chief. All correspondence welcomed of course.