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Biological preserved specimens

Posted by Anonymous on Fri, 2020-02-28 16:11

Biological preserved specimens: What are the rules for storing and/or disposing of biological preserved specimens?

Science ASSIST has received the following 4 questions, which all relate to this topic.

Q1 We have specimens that have been preserved in Formaldehyde. These specimens are used for demonstration purposes only. What are the legal requirements for these specimens? Is it legal for us to still have them on campus? How should they be stored?

Q2 We have many jars of biology specimens (beetles, frogs etc) with a liquid in them. Some of the liquid has evaporated. My teacher is worried that it is in the environment in her classroom. Is this dangerous? Can we top up with Formaldehyde?

Q3 I've read the question and response about dealing with preserved specimens (<https://assist.asta.edu.au/question/2651/preserved-specimens>) that are intended to be kept, however how can specimens in an unknown solution be safely and legally disposed of?

Q4 There seems to be a collection of half-empty specimen jars in my Lab classroom. 1. We are not sure of the liquid used to "preserve" the specimens 2. We would rather dispose of them entirely. What is the process of disposing of these jars?

Voting:



No votes yet

Laboratory Technicians:

Laboratory Technicians

Showing 1-1 of 1 Responses

Answer by labsupport on question Biological preserved specimens

Submitted by sat on 28 February 2020

Storage of preserved biological specimens

Traditionally, solutions of formaldehyde were used for preserving biological specimens. Many old existing preserved biological specimens in schools contain formaldehyde and or other hazardous solutions. Schools are not prohibited from having biological specimens in formaldehyde, unless it is banned by their school jurisdiction or sector. It should however be understood that there are risks associated with exposure to formaldehyde. If your school has specimens in formaldehyde, it is important to be aware of the hazards and ensure that suitable controls are in place to reduce your risk of exposure. If the specimens in formaldehyde are in well-sealed jars the risk of exposure is very low. Preserved biological specimens may now be purchased in less hazardous solutions.

Storage advice for preserved biological specimens:

- Store specimens in screw capped containers that are non-reactive to the storage fluid. The seal should prevent evaporation of the storage solution, and metal lids should be avoided as they may corrode and eventually leak.
- Use Parafilm to provide an additional seal.
- Affix a label indicating the storage solution that the specimen is in.
- Check the condition of all containers and using safe procedures (referring to specific SDSs, wearing appropriate PPE and working in a fume cupboard or well ventilated area), either replace compromised lids or place the contents in another container for storage or waste disposal.
- Regularly monitor for fluid levels, compromised containers and defective lids etc.
- Store under conditions to prevent deterioration of the specimen (and solution) i.e. a cool dry place with good ventilation, low-light levels and out of direct sunlight.

Evaporation of the storage solution may indicate that the seal on the jars is not adequate. If the specimens are stored in the classroom and the teacher is in the classroom all day every day, then they are more at risk of exposure to hazardous fumes than students who would probably only be in the classroom for a few lessons per week. The only way to determine if workplace exposure standards have been exceeded is to undertake air monitoring for formaldehyde. The most effective control to reduce the risk of exposure is to remove or eliminate the hazardous chemical.

If your specimens are in good condition: you may wish to keep them. A range of strategies could be used to minimise that risk of exposure such as:

- Move them to another location, which is well ventilated.
- Transfer them (using safe procedures) to suitable jars which have an air-tight seal
- Transfer them (using safe procedures and a stepped process to avoid osmotic issues) into a less hazardous (and known) storage solution.
- Seek further help from a local museum, which may have expertise in this area

If your specimens are in poor condition: then it may be best to arrange for disposal of the specimen and the solution, by a licenced chemical waste contractor. Consideration could be given to finding an alternative, such as specimens embedded in resin, which are very resilient to student handling.

If you do not know what the storage solution is: then you should not top up the jars, as you may be combining incompatible chemicals resulting in the generation of new substances that have unknown properties and unknown hazards, creating a potentially violent chemical reaction or damage to the specimen.

Note: Science ASSIST strongly advises against formaldehyde (methanal) being used in a school science setting. It is a Category 1 (known) human carcinogen, has acute toxicity, and is a Category 2 drug precursor. See references for further information. Formaldehyde is not included in the Science ASSIST List of recommended chemicals because of its acute health hazards, and because it is not regarded as essential or important to the science curriculum.

Disposal of biological preserved specimens

The best way to dispose of biological preserved specimens is to arrange for disposal 'as is' from a licenced chemical waste contractor.

- If the specimens are in unknown liquids, sometimes these may even be in old food jars, it is not worth the risk or the time and effort to try to combine them into larger jars. We recommend leaving the specimens in the jars that they are in.
- Specimens in unknown liquids should be labelled as being in an unknown solution.
- Store the specimens in an appropriate well-ventilated area, until such time as they are disposed of.

It is a good idea to combine a disposal of these with any other chemicals that need disposal. Science ASSIST recommends that you:

- audit your chemical store for any unwanted chemicals
- check on the integrity of the chemical containers and the condition of the chemicals to see if any have deteriorated/ been degraded
- see if your disposal can be combined with a whole school waste disposal or with schools in your geographical area.

Previous Q&As

We refer you to some of our previous Q&As, that provide further information:

[preserved specimens](#) which contains detailed information about

- Handling unknown chemical solutions
- Replacing the old preserving solution
- Fixation & preservation methods
- Alternative preservation solutions

Preserving sheep brains without formalin which contain detailed information about

- Chemical Methods and safe methods for preparing preservative solutions
- Alternative options and preservation methods
- Labels for preserved specimens

Calf Foetus which contain detailed information about

- Recommended preservative solutions
- Stepped procedure for replacing old preservative solutions
- Detailed method for replacing methylated spirits with new preservative solution
- Safety when working with preserved specimens

References and further reading

Bocaege, E., Cooke, M., & S. J. M. M. Alberti, 2013. Endangered specimens, endangered skills: a museum conservation initiative. *Papers on Anthropology*, 22, 303-308.
<https://doi.org/10.12697/poa.2013.22.31>

'Formaldehyde - technical fact sheet', SafeWork NSW website, <https://www.safework.nsw.gov.au/resource-library/hazardous-chemicals/formaldehyde-technical-fact-sheet> (Accessed February 2020) (See Health effects and Exposure Standards and air monitoring)

'Formaldehyde in laboratories', National Industrial Chemicals Notification and Assessment Scheme (NICNAS) website, <https://www.nicnas.gov.au/chemical-information/factsheets/chemical-name/formaldehyde-in-laboratories> (Accessed February 2020) (See 'Recommendations' and 'Occupational exposure standard')

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