Formalternate

Introduction

Stop exposure to formaldehyde without discarding any expensive, preserved biological specimens. Replace the formaldehyde with Formalternate®—a safer, non-formaldehyde substitute.

Materials

- Formalternate®
- Water, distilled and tap
- Large sink with water
- Preserved specimens
- Tubing
- Waste container

Safety Precautions

Formalternate is a non-formaldehyde proprietary mixture containing propylene glycol. It is mildly toxic by ingestion and inhalation and a body tissue irritant. Avoid contact with eyes and skin. Wear chemical splash goggles, chemical-resistant gloves, and a chemical-resistant apron. Wash hands thoroughly with soap and water before leaving the laboratory and follow all laboratory safety guidelines. Please review current Safety Data Sheets for additional safety, handling, and disposal information.

Procedure

1. Work under a chemical fume hood or in a well ventilated area. *Note:* Before starting this procedure, please read the disposal section of this handout. Check with local wastewater authorities about drain-disposal of formaldehyde. Do not use this procedure if your school uses a septic field.
2. Decant the formaldehyde solution from preserved specimens into a waste container. Be careful not to damage small or fragile specimen samples.
3. Fill the specimen container with water. Allow the specimens to soak in the water for half an hour.
4. Decant the water into the waste container.
5. Place the specimen container in a large sink.
6. Attach a length of tubing to the faucet and, wearing goggles, apron, and gloves, force the exit end of the tubing into the very bottom of the specimen container.
7. Turn the cold water on very slowly. A very slow, but steady flow is desirable. Allow the water to flow into the bottom of the specimen container, rinsing the formaldehyde preservative to overflow into the sink for several hours.
8. While the specimens are rinsing, prepare the correct volume of Formalternate. Dilute one volume of Formalternate with nine volumes of water. Mix well.
9. After the rinsing is complete, turn off the water, remove the tubing, and drain all of the remaining water out of the specimen container. Replace the water with the diluted Formalternate.

Disposal

Please consult your current *Flinn Scientific Catalog/Reference Manual* for general guidelines and specific procedures, and review all federal, state and local regulations that may apply, before proceeding. Formaldehyde may be disposed of according to Flinn Suggested Disposal Method #2. Formalternate can be disposed of down the drain with an excess of water according to Flinn Suggested Disposal Method #26b.

Connecting to the National Standards

This laboratory activity relates to the following National Science Education Standards (1996):

Unifying Concepts and Processes: Grades K–12
Evolution and equilibrium

Publication No. 952
032417

Content Standards: Grades 5–8

Content Standard A: Science as Inquiry

Content Standard C: Life Science, structure and function in living systems, diversity and adaptations of organisms

Content Standards: Grades 9–12

Content Standard A: Science as Inquiry

Content Standard C: Life Science, biological evolution

Tips

- The washing procedure will not remove every bit of the formaldehyde. When an animal or specimen is opened as part of the dissection process, the residual formaldehyde will still be evident (by odor). However, the risk has been drastically reduced. If residual formaldehyde is still an issue, simply elect to discard any formaldehyde-preserved materials and start with new, non-formaldehyde preserved specimens.
- Do not replace the formaldehyde liquid in museum jars or other display jars. Despite claims to the contrary, the for aldehyde substitutes will not preserve the display animals for decades and decades, as is the case with formaldehyde. To protect against formaldehyde evaporation from these kinds of containers, acquire some paraffin wax, (Flinn Scientific Catalog No. P0003). Melt enough wax in a large beaker or flask to enable the complete immersion of the cap or closurportion of the museum jars. Allow the hot wax to thoroughly surround the cap of the museum jar. This wax will give a seal that will last for years.
- Formalternate can be used in place of formaldehyde for the storage of biological specimens; however, it is not a chemical substitute in the fixation of specimens. Fresh specimens must be initially fixed in formalin, a 10% forma dehyde solution (Flinn Scientific Catalog No. F0035). Read the hazard warnings and follow all safety procedures when working with formalin.

Formalternate® is available from Flinn Scientific, Inc.

Catalog No.	Description
F0056	Formalternate®, concentrate, 500 mL
F0035	Formalin, 1 L
P0003	Paraffin, wax, 1 lb.

Consult the Flinn Scientific website for current prices.