



UCCS SAFE OPERATING PROCEDURE

47. SAFE HANDLING AND DISPOSAL OF PRESERVED SPECIMENS

(For assistance, please contact [Environmental Health & Safety](#))

Biological specimens¹ such as fish, amphibians, mammals and other organisms are often placed in a sealed container with a preserving solution to prevent the tissues from decomposing. A “wetting solution” is often used during teaching labs to maintain specimen integrity. The most commonly used preserving solutions are:

Formaldehyde and water	Formaldehyde/methanol (“formalin”) and water
Acetic acid, ethanol, formaldehyde and water (sometimes abbreviated FAA)	Wetting solution (3.7% phosphate-buffered Formalin)
Glycerin and methanol (“glycerol”)	Glycerin
Carosafe	Nebanol

Sometimes the specimen is left in the original preservative solution for long-term storage. More commonly, the initial preserving solution is poured off and the specimen is placed into a less hazardous solution to minimize exposures

Where possible, formaldehyde, methanol, and ethanol solutions are avoided, minimized or diluted. Formaldehyde is a suspected human carcinogen with a Permissible Exposure Limit² (PEL) of 0.75 ppm (TWA³); 2 ppm (STEL⁴).

Methanol and ethanol are flammable liquids. Specimens in flammable preservatives must be stored in flammable liquid storage cabinets or in engineered flammable liquid storage rooms. This is required when quantities exceed 1 gallon. Specimen containers must be labeled the same as any other chemical container; the storage solution, not the initial preserving solution, must be recorded on the label. Formaldehyde must always be listed on the label when it is used due to its toxicity and volatility. If the preserving solution is not known, it must be assumed to be formaldehyde, methanol and water since this is the most hazardous solution used.

When no longer required for teaching or research, specimens must not be disposed of as ordinary garbage but are handled by the biohazard contractor. Preserving and storage solutions are managed as hazardous waste, and must be labeled for [EH&S](#) collection.

¹ For purposes of this SOP preserved specimens also includes teaching and research human cadavers.

² Permissible Exposure Limit (PEL): maximum [concentration](#) to which a worker may be exposed

³ Time Weighted Average (TWA): average exposure over 8-hour shift

⁴ Short-term Exposure Limit (STEL): concentration to which workers may be exposed for a short period of time without suffering from [irritation](#), [chronic](#) or irreversible tissue damage, or [narcois](#) of sufficient degree to increase the likelihood of accidental injury, impair self-rescue or materially reduce work efficiency.

Last reviewed by Cynthia Norton on September 22, 2021.