

STANDARD OPERATING PROCEDURES: Perfusates -Formaldehyde, Formalin, Paraformaldehyde and their solutions

Department:	
Principal Investigator(s):	
Laboratory Manager/Supervisor (or designated laboratory-specific chemical hygiene officer):	
Laboratory emergency contact (name and phone):	
Laboratory phone:	
Designated area (s) of these procedures with chemical(s): (building and room):	
Agent storage location (building and room) and specifics regarding location/container/cabinets:	

Chemical Information

Chemical Name(s), including CAS No:   	Formaldehyde (CAS 50-00-0), Formaldehyde Solutions, and Paraformaldehyde (CAS 30525-89-4)
GHS Classification and Hazard Statements (see SDS sheet provided by the chemical's manufacturer): PERMISSIBLE EXPOSURE LIMIT =20 ppm ; A potential occupational carcinogen. (NIOSH, 2024) Formaldehyde (CAS 50-00-0) is H ₂ CO. This is the simplest aldehyde and is a gas at room temperature. • Formalin is a saturated formaldehyde solution (usually 37%), so 10% formalin is roughly 3.74% formaldehyde. • Some solutions have methanol added to stop polymerization; these solutions may be flammable or combustible. • Paraformaldehyde; PFA (CAS 30525-89-4) is polymerized formaldehyde. PFA is used to make very pure formaldehyde solutions or can be heated to create pure formaldehyde gas. Acutely toxic via ingestion, inhalation, and skin contact. Causes skin corrosion and serious eye damage. Skin sensitizer; may cause an allergic skin reaction. Suspected mutagen.	

Signs and symptoms of exposure or release	Headache, rhinitis, and dyspnea; higher doses may cause severe mucous membrane irritation, burning, and lacrimation, and lower respiratory effects such as bronchitis, pulmonary edema, or pneumonia. Sensitive individuals may experience asthma and dermatitis.
Routes of exposure	Inhalation, skin contact, ingestion, parenteral inoculation, splash to eyes and mucous membranes.
Required engineering controls: (i.e., chemical fume hood, biological safety cabinet, glove box, temperature control, humidity control, shielding, luer-lock syringe, in-line HEPA filter, etc.)	Eyewash required in immediate work area. Safety shower may be required for large quantities. Work with concentrated solutions (>4%) and all solids only in a certified chemical fume hood, downdraft table or necrop station.
Personal Protective Equipment (PPE) required for procedures:	Nitrile (or latex) gloves (Change immediately if contaminated and every 2 hours. Wash hands at time of change.) Splash goggles Fully buttoned lab coat with sleeves extending to the wrists. Risk of splash/large amounts: (in addition to the above, wear) • Face shield. • Tyvek sleeves and/or gown/apron.
Known incompatibilities with chemical(s):	Strong acids and bases, iodine, iron, silver, isocyanates, amines, anhydride. Pure formaldehyde may self-react to polymerization.
Special storage and handling considerations:	Store with flammables in tightly-closed shatter-resistant containers. Store away from oxidizers, reducing agents, metals, and acids (not in cold room). Use secondary container for transport. Labs handling >100 ml regularly on the benchtop must contact UK OHS for exposure assessment. • Designate a work area for formaldehyde and label it. • Keep containers closed as much as possible. • Line work area with absorbent, leak-proof bench pads. • If weighing, place balance in hood OR use Tare Method • Decontaminate with soap and water solution.
Please list the approximate amount(s) of chemical(s) utilized in all procedures	

Please describe, in a stepwise fashion, the work practices and procedures involved in the handling and utilization of this agent.

Please be clear and complete in the description of procedures (i.e., measuring, weighing, pouring, mixing, injection, mixing, transporting, administration to animals, heating, etc.).

Be sure to include any precautionary safety steps undertaken during these procedures.

Please submit additional pages, if necessary.

Waste collection and disposal procedures:	Waste chemicals shall be collected in a secured area. The area shall be free from evidence of spills. A Hazardous Waste label shall be affixed to the collection container and components shall be listed on the label as they are introduced into the container. Do not date containers until the day of scheduled pickup. Additionally, the container shall be marked with the hazard class of the chemical waste (i.e., Ignitable, Toxic, Reactive, Corrosive). When the container is no more than 2/3 full, date the container and submit a pick-up request in the UK E-trax system: https://etrax.chematix.com/Chematix/
Spill procedure: Lab Specific Notes on Spill Response:	Major spills of stock solution: Leave the area and notify others not to enter. Report the spill to the UK Environmental Quality Management Department (EQMD) at (859) 323-6280 (M-F 8am-5pm) or after hours by dialing 911 from any on-campus phone or by contacting the UK Police at (859) 257-UKPD (8573). Minor spills of manageable amount: If necessary, contact EQMD for guidance. Consult manufacturer's SDS for instructions and compatibilities for your chemical (Be aware of any materials such as paper towels or water that could be incompatible with your spilled chemical!)
Response procedures in the case of an incident or injury:	UK Employees: • After receiving first aid (refer to the chemical's SDS), report the occupational exposure to a hazardous chemical to UK Worker's Care at 1-800-440-6285. • If needed, an appointment will be made for the employee at UK UHS. • For severe emergency or injury, call 911 or proceed to the UK Chandler Hospital Emergency Department UK Students: • Call UHS at (859) 323-APPT to report an occupational exposure to a chemical hazard. • If needed, an appointment will be made for the employee at UK UHS. For severe emergency or injury, call 911 or proceed to the UK Chandler Hospital Emergency Department Additional Lab-Specific Emergency Procedures:

A copy of the manufacturer's SDS for this agent and the PI approved SOP shall be kept in the lab's Chemical Hygiene Plan (CHP). The CHP shall be stored in a location known to all laboratory personnel and is accessible during work hours.

Personnel Training

- Prior to conducting any work with (name of the chemical), designated personnel must be provided training specific to the hazard involved in working with the substance.
- The PI must provide his/her lab personnel with a copy of the SOP and a copy of the SDS provided by the manufacturer. Any further training materials must be documented and stored in the lab's Laboratory Safety Manual and available to internal UK or external oversight agency inspectors.
- The PI must ensure that his/her lab personnel have completed the initial and the consecutive annually required Chemical Hygiene trainings and Hazardous Waste training.

The undersigned have read and understood the content of this SOP and the SDS for: **Formaldehyde, Formalin, Pareformaldehyde**

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SOP Reviewed and Approved by:

PI: (typed name)	
PI: (signature and date)	
Lab Manager/Supervisor (typed name)	
Lab Manager/Supervisor (signature and date)	