





LABORATORY SAFETY GUIDELINE

Phenylmethylsulfonyl fluoride (PMSF) [CAS No. 329-98-6]

All users of PMSF must review this document before use. In biochemistry, PMSF is a serine protease inhibitor commonly used in preparation of cell lysates. It is rapidly degraded in water and stock solutions are usually made up in anhydrous ethanol, isopropanol, corn oil, or DMSO (Dimethyl sulfoxide). Users should contact their EHS Laboratory Safety Advisor and department safety officer if they have questions before beginning work.

HAZARDS

	Toxic if swallowed
	Extremely corrosive and destructive to tissues. May cause irreversible eye damage.

PMSF hydrolyzes upon exposure to water/moisture, liberating a toxic and corrosive gas (hydrogen fluoride) that in contact with metal surfaces can generate flammable and/or explosive hydrogen gas.

PRECAUTIONS

Before starting work:

- Determine if you can use a less hazardous substance (e.g., 4-[2-aminoethyl]-benzenesulfonyl fluoride, hydrochloride or Pefabloc) in place of PMSF;
- Review manufacturer's Safety Data Sheet and additional chemical information at ehs.harvard.edu/safety-data-sheets-sds;
- Ensure that a written experimental protocol including safety information is available;
- Be familiar with general University emergency procedures in the [EHS Lab Emergency Response Guide](#);
- Order the most dilute solutions available that will meet experimental needs. Order only the quantity that you need;
- Identify the location of the nearest eyewash and shower and verify that they are accessible;
- Locate and verify that appropriate spill cleanup materials are available, including the following: paper towels, ethanol or isopropanol.
- Ensure another person who knows emergency procedures is in the area.

During work:

- **AVOID INHALATION!** Perform all operations in a certified chemical fume hood or other approved ventilated enclosure. Sash lowered as much as possible. Always work at least 6 inches into the fume hood and behind the sash;
- **AVOID CONTACT!** Use appropriate personal protective equipment (PPE):
 - Wear a lab coat, a garment covering to the ankles, and closed-toed shoes;
 - Tightly fitting safety goggles
 - Nitrile gloves with at least a 0.11 mm thickness for both splash and immersion protection. Double gloving is recommended.
 - Always consult Safety Data Sheet to ensure proper glove selection
 - Gloves must be thoroughly inspected prior to each use. Do not use damaged gloves;
 - Change gloves whenever you suspect they have become contaminated;
 - Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact;
 - Wash hands and forearms thoroughly with soap and water each time gloves are removed;
- Use materials and containers appropriate for PMSF use and remain aware of potential incompatibilities; PMSF is incompatible with water, acids, bases, and strong oxidizing agents. **Do not store PMSF in glass or mild steel/galvanized containers.** Store in a cool, dry, and well-ventilated area away from incompatible chemicals.

- Keep all containers tightly closed when not in use and during transport.

After completing the work:

- Dispose of PMSF waste following Harvard University Hazardous Waste Procedures
 - Hazardous Waste Classification: Corrosive and Toxic
 - PMSF may corrode/etch glass and many metals; therefore, do not store aqueous solutions of PMSF in glass or mild steel/galvanized containers.
- Return container to storage area following Harvard University Laboratory Chemical Storage Guide
 - Storage Group: General Storage ;
 - Store in original containers or other appropriate containers;
 - Store primary container in designated and compatible secondary containers;
 - Store away from incompatibles;
- Wash hands and forearms thoroughly with soap and water before leaving the lab.

EMERGENCY PROCEDURES

First Aid

SKIN CONTACT

- Wash with plenty of tepid water for at least 15 minutes using the closest available sink, safety shower or drench hose. Remove any exposed clothing as well as any jewelry.
- Immediate medical treatment is necessary as untreated wounds from corrosion of the skin heal slowly and with difficulty.

EYE CONTACT

- Only small amounts of water splashed into eyes can cause irreversible tissue damage and blindness. Rinse immediately with plenty of water. Using eyewash, flush eyes while holding eyelids open;
- Seek medical attention; call 911 on a landline phone for medical assistance (or provide location if calling on a mobile phone).

INHALATION

- Move to fresh air;
- If unconscious or symptoms persist; call a physician.

INGESTION

- If ingested, consult a physician. Symptoms of poisoning may appear several hours later.
- Never give anything by mouth to an unconscious person;
- Seek immediate medical attention; call 911 on a landline phone for medical assistance (or provide location if calling on a mobile phone).

Spill Response

OUTSIDE FUME HOOD OR VENTILATED ENCLOSURE

- Alert others and evacuate to a safe distance and prevent entry.
- Contact the University Operations Center at (617) 495-5560 [HMS/HSDM (617) 432-1901]
- Remain in a safe location until EH&S or other response personnel arrive.

INSIDE FUME HOOD OR VENTILATED ENCLOSURE (< 500 ml)

- If trained and confident, you may assist in the clean-up effort of small amounts, wearing PPE described above and using appropriate spill supplies.
 - Cover a PMSF spill with paper towels; if it is a spill of solid material, cover with paper towels and add isopropanol or ethanol to bring solid into solution;
 - Collect all materials used to clean up the spill;
 - PMSF is unstable in aqueous and basic (alkaline) aqueous solutions. A 5% solution of sodium carbonate can be made to decontaminate surfaces and containers.
 - Collect debris in appropriate container and move to your Satellite Accumulation Area. Label with appropriately completed hazardous waste tag and request a waste pickup.
- Otherwise close the fume hood sash and await support.
- Contact the University Operations Center at (617) 495-5560 [HMS/HSDM (617) 432-1901] if you need support or technical assistance.