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| ***Danger! Releases HF!***  | **Duke OESO Guidelines for Safe Use of****PMSF and other HF releasers***Covers: phenylmethylsulfonyl fluoride & other compounds listed below****Complete Lab-Specific Safety Information on page 2*** |  ***Danger! Releases HF!*** |
| **Hazards** | **Potential Hazards** | * Phenylmethanesulfonyl fluoride (PMSF), p-toluenesulfonyl fluoride, Sodium Fluoride (NaF), Potassium Fluoride (KF), and other fluoride compounds can release hydrogen fluoride (HF) in contact with acids and sometimes water (PMSF).
* HF is fatal in contact with skin, or if inhaled or swallowed. Causes severe skin and eye burns.
* PMSF hydrolyzes upon exposure to water liberating a toxic, acidic gas which, in contact with metal surfaces, can generate flammable and/or explosive hydrogen gas.
* HF Exposure limits: ACGIH TLV – 2 ppm ceiling, 0.5 ppm average over 8 hrs. OSHA PEL: 3 ppm.
* For more information, see the SDS, the [PubChem Information for PMSF](https://pubchem.ncbi.nlm.nih.gov/compound/Phenylmethylsulfonyl-fluoride#section=Safety-and-Hazards) (or applicable compounds) and the [Duke Guideline for Safe Use of Hydrofluoric Acid](https://www.safety.duke.edu/sites/default/files/Guidelines%20Hydrofluoric%20Acid.docx).
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| **Hazard Controls** | **Selection & Purchase** | * Purchase the smallest, shatter-resistant containers at **the lowest concentration practical.**
* Buy calcium gluconate gel for first aid for HF burns, and check expiration date regularly.
* Consider [alternate methods](https://www.safety.duke.edu/laboratory-safety/work-practices-ppe/safer-alternatives) such as Pefabloc SC, Halt cocktail, or other protease inhibitor instead of PMSF, or less hazardous compounds in lieu of other HF releasers.
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| **Storage & Transport** | * Store in compatible (e.g., polyethylene) **primary** and **secondary** containers.
* If making aqueous or acidic solutions **DO NOT** use glass containers – HF acid etches glass.
* Keep the primary container tightly closed.
* Store in a **dry** area **away from acids**.
* Store in **secondary containment** in a **well-ventilated area.**
* Chemical Fume Hood Flow DiagramStore **below eye level** but **not on the floor**.
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| **Engineering Controls** | * **Eyewash is required** in **immediate work area. Safety shower** required for work with > 200ml stock solution.
* Handle powders and concentrated solutions in a **clean** **chemical fume hood**.
 | Safety Shower, Shower, Douche, Help**Eye Shower, Eye Wash, Rinse Eyes, First Aid, Sign** |
| **Work Practice Controls** | * Use page 2 to create a lab-specific SOP. For PMSF get PI approval.
* Have an **area** in the laboratory that is **designated and marked for HF releaser use**.
* Keep PMSF and HF releasers away from acids and water/moisture. Use with **DMSO is highly discouraged**.
* **DO NOT** use glass, ceramic, or other incompatible containers if HF may be released.
* Once work is complete, **decontaminate** the area by wiping with a 10% sodium carbonate (Na2CO3, also known as soda ash) solution.
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| **Personal Protective Equipment****(PPE)** | * lab coat2Wear **closed-toed shoes** and **clothing covering the legs**.

**x2*** **Minimum PPE (See** [Duke HF acid guideline](https://www.safety.duke.edu/sites/default/files/Guidelines%20Hydrofluoric%20Acid.docx) **for spill PPE):**
	+ Buttoned lab coat
	+ Safety goggles
	+ Double nitrile gloves (Change immediately if splashed) - Check compatibility with solvents
* **Wash hands** at time of glove change.
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| **Other** | **Emergencies** | * Use the [Duke Guideline for Safe Use of Hydrofluoric Acid](https://www.safety.duke.edu/sites/default/files/Guidelines%20Hydrofluoric%20Acid.docx) emergencies section if there is a medical emergency or spill. A [Hydrofluoric Acid First Aid Guide](http://www.safety.duke.edu/sites/default/files/Hydrofluoric_Acid_FirstAid_Guidelines_0.pdf) is also available.
* **DO NOT USE WATER to clean up spills!** Use 10% sodium carbonate solution.
* See Emergency Response [webpage](https://www.safety.duke.edu/emergency) or flip chart and/or lab specific chemical hygiene plan.
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| **Waste** | See lab-specific chemical hygiene plan, [Lab Chemical Waste Management Practice](http://www.safety.duke.edu/sites/default/files/labwastemgt.pdf), and [Drain Disposal Practice](http://www.safety.duke.edu/sites/default/files/drain_disposal_practice.pdf). Do not combine with waste that contains incompatible chemicals such as water, oxidizing agents, strong bases, acids, and aqueous solutions. |
| **Training** | Sign signature page in lab-specific chemical hygiene plan to indicate review. |
| **Questions** | Contact OESO Lab Safety at 919-684-8822 or labsafety@dm.duke.edu. |

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| **Lab-Specific Safety Information for** **PMSF and HF releasers*****Supplements the Guidelines for Safe Use*** ***Danger! Releases HF!******Danger! Releases HF!******of PMSF and HF releasers******PI signature is required for PMSF. OESO approval is not needed if using this Guideline.*** |
| **Lab Info** | **PI Name** | Click or tap here to enter PI Name | PI Signature:Date: Click or tap to enter a date. |
| **Location** | Enter building(s) and room(s) where lab is located |
| **Lab-Specific Hazard Controls****Lab-Specific Hazard Controls, continued** | **Purchase****Details** | Specific HF releaser present | Enter HF releaser name | Enter HF releaser name | Enter HF releaser name |
| Maximum container size | Enter maximum container size purchased | Enter maximum container size purchased | Enter maximum container size purchased |
| Maximum concentration | Enter maximum concentration purchased | Enter maximum concentration purchased | Enter maximum concentration purchased |
| Container type | Enter the container material | Enter the container material | Enter the container material |
| Specific product info. | Enter supplier name/product number, purity/grade, liquid vs. powder. | Enter supplier name/product number, purity/grade, liquid vs. powder. | Enter supplier name/product number, purity/grade, liquid vs. powder. |
| **Storage**  | Specific location | Enter specific storage location | Enter specific storage location | Enter specific storage location |
| **Use Information** | Designated work area (specific room(s) and area(s)) | Enter rooms and areas designated for use | **Label work area!** |
| Container type to use | Type of container in which HF releasers are used or stored in the lab | **No Glass****For Aqueous Solutions!** |
| Maximum quantity  | Enter maximum quantity to be used at a time | Enter maximum quantity to be used at a time | Enter maximum quantity to be used at a time |
| Typical concentration used  | Enter typical concentration used | Enter typical concentration used | Enter typical concentration used |
| Solvent (and gloves) to be used.**DMSO is highly discouraged** | List solvent and provide type of gloves to be used | List solvent and provide type of gloves to be used | List solvent and provide type of gloves to be used |
| PPE Storage Location  | Location of PPE supplies. |
| Location of supplies for decontamination and spill clean-up | Location of 10% sodium carbonate solution and other spill supplies.. |
| **Exposure Response** | Calcium Gluconate Location | Location of calcium gluconate gel for first aid use. |
| **Waste Information** | Details about waste (location, type of containers)  | Enter waste collection details – location, type of container | **Don’t mix with Aqueous Solutions!** |
| **Details of Process** | 1. Enter steps used in lab process(es) or experiment(s)
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