

**Standard Operating Procedure**  
for work with

Chemical name/class: Sodium Fluoride (NaF) CAS #: 7681-49-4  
PI: Mark Walters Date: April 13, 2022  
Building: Fitzpatrick CIEMAS Room #: Cleanroom and Sample Prep  
Designated Work: Chemical processing with Sodium Fluoride

1. **Circumstances of Use:**

Sodium Fluoride (NaF) is typically used in the SMIF Sample Prep lab for chemical processing.

2. **Potential Hazards:**

Consult the Safety Data Sheet (SDS) for Sodium Fluoride.

**Sodium Fluoride is an HF releaser and presents a significant hazard for personal injury. HF is a high risk category 1 chemical because it can be fatal in contact with skin.**

Be aware of these specific hazards:

- HF can be irritating to the skin, eyes, and respiratory tract. Contact with exposed body parts can cause painful burns and even death.
- NaF is acutely toxic, and is a skin and eye irritant. It is toxic if swallowed.

3. **Engineering Controls:**

- Always work with NaF in a designated solvent fume hood in the Clean Room or Sample Preparation Lab.
- It should never be used with acids or in an acid fume hood. **Contact with acids can liberate very toxic gas.**
- **Do not use glass containers, as NaF reacts dangerously with glass.**
- An eyewash and safety shower are available in the immediate area.

4. **Work Practice Controls:**

- Use only in a designated solvent chemical hood.
- Keep containers closed as much as possible. Only open a container when it is inside a designated solvent chemical hood and you are wearing the proper PPE (section 5).
- Contaminated items are to be disposed of properly as hazardous waste, following SMIF's hazardous waste policy (see section 7).

5. **Personal protective equipment (PPE):**

*Cleanroom*

- Standard cleanroom attire, which includes nitrile gloves (double glove) and safety glasses.

*Sample Prep Lab*

- Fastened lab coat
- Nitrile gloves (double glove)
- Safety glasses or goggles

6. **Transportation and Storage:**

- Sodium Fluoride must be in sealed shatter-resistant compatible containers (e.g., polyethylene) and stored in an exhausted flammable solvent cabinet designated for solvents.
- **Do not store in glass containers, as NaF reacts dangerously with glass.**
- Wear the designated PPE (section 5) when transporting a NaF bottle or container to a chemical hood.

7. **Waste Disposal:**

*Liquid Waste*

NaF waste should be poured into a dedicated NaF waste container kept inside the solvent hood. ***Never pour NaF down the solvent cup drain***

*Solid Waste*

Solid materials that are contaminated with chemical sodium fluoride waste (such as wipes, dispensers, etc.) should be packed into a zip lock bag and properly labeled with the type of waste, your name, and date. The waste bag should be completely sealed.

- Bagged, sealed, and labeled NaF waste should be placed in one of the solvent waste cans for pickup by SMIF staff. In the cleanroom these are located near the spin coat hoods in the photo area, and in the Sample Prep lab these are located near the solvent hood.
- Empty sodium fluoride bottles should be left in the solvent hood for pickup by SMIF staff

8. **Exposures/Unintended contact:**

Contact Employee Occupational Health and Wellness (EOHW) at 919-684-3136 for medical advice on occupational chemical exposures.

Simple washing of an NaF splash is not sufficient to prevent damage. If you suspect you have been exposed to NaF, treat as if it were an HF exposure. You should immediately do the following:

1. Rinse off the exposed area with water (e.g., the safety shower) for 5 minutes
2. Immediately apply Calcium Gluconate Gel to the exposed area. This Gel can be found at all Acid Hoods in SMIF.
3. Call 911 from a campus phone or 919-684-2444 from any phone and request immediate medical assistance. Be sure that medical personnel know that it is a potential HF exposure and know that it requires specific treatment different from a common acid or chemical exposure. **Make sure that a copy of the HF Medical Treatment and First Aid Guidelines are available to medical personnel.**

**Complete First Aid Guidelines for Treating HF exposures can be found at all SMIF Acid Hoods and the SMIF Emergency Response Station.**

Contact Employee Occupational Health and Wellness at 919-684-8115 for exposure-related advice.

The work-related injury or illness report found at: <http://www.hr.duke.edu/benefits/medical/workcomp/report.php> should be completed within 24 hours. Follow-up medical attention should be sought through Duke Employee Occupational Health and Wellness (919-684-3136).

9. **Spill Procedure:**

In the event of a spill, follow SMIF spill procedures and immediately contact SMIF staff. Only SMIF staff and/or appropriate OESO personnel should clean up spills

**Spills Contained Inside a Chemical Hood**

- Avoid breathing vapors from the spill and leave the immediate area of the chemical hood
- Alert people in the immediate area of the spill
- Notify SMIF immediately by calling emergency numbers posted near the phone
- Wait for instructions from SMIF or for SMIF personnel to arrive to complete the clean-up of the affected area.

**Spills Outside of a Chemical Hood**

- Attend to injured or contaminated persons and remove them from exposure
- Press the closest manual alarm button (blue box) and evacuate the lab
- Make yourself available to the SMIF staff and/or emergency responders and be prepared to tell the following: What chemical(s) are involved, how much was spilled, where the spill is located, nature of any injuries

10. **Training of personnel:**

- All personnel are required to complete the SMIF General Lab Safety session and the SMIF Chemical Safety and Wet Hood training session.
- All personnel shall read and fully adhere to the ***Wet Hood Operating Procedure*** and the ***SMIF Lab Safety and Procedures Manual***