Standard Operating Procedure for Sodium Hydrosulfite (also known as Sodium Dithionite)

CAS number: 7775-14-6

# Section 1 – Lab-Specific Information

**Building/Room(s) covered by this SOP: Bag 005, 023**

**Unit or department: Chemistry**

**Principal Investigator Name: Sarah Keller**

**Principal Investigator Signature/Date:  24 Feb 2025**

**This SOP was created by (if not PI): Not applicable**

**Name/Title/Date/Signature**

Sodium hydrosulfite (also known as sodium dithionite) is typically used in our lab as a aqueous quencher of fluorescent dyes such as NBD, following standard protocols throughout the literature.

# Section 2 – Hazards

**Hazards may include, but are not limited to:**

* Harmful if swallowed.
* Causes serious eye irritation.
* Harmful to aquatic life.
* Self-heating; may catch fire



# Section 3 – Engineering Controls and Personal Protective Equipment (PPE)

## Engineering controls

Use sodium hydrosulfite in a fume hood to avoid the spread of dust and to avoid breathing product sulfurous gases. Any chemical fume hood used must be tested and passed by EH&S.

## Hygiene measures

Avoid contact with skin, eyes, and clothing. Wash hands after removing PPE, before breaks, and immediately after handling the chemical. If sodium hydrosulfite comes into contact with any PPE, the PPE shall be immediately removed and discarded properly. Any potentially exposed body parts should be washed immediately.

## Skin and body protection

Wear a lab coat, nitrile gloves, and protective eye wear.

Chemically compatible laboratory coats that fully extend to the wrist must be worn and be appropriately sized for the individual and buttoned to their full length. Personnel must also wear full-length pants, or equivalent, and close-toe shoes. The area of skin between the shoe and ankle must not be exposed.

## Hand protection

Nitrile gloves are required for the activities described in this SOP.Gloves must be inspected prior to use, including a check for pinholes.

Use proper glove removal technique (without touching glove’s outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands immediately after glove removal.

## Eye protection

ANSI Z87.1-compliant eye protection is required for all work with sodium hydrosulfite. Ordinary prescription glasses will NOT provide adequate protection unless they also meet the Z87.1 standard and have compliant side shields.

## Respiratory protection

Respiratory protection is not required for the activities described in this SOP.

Respirators should be used as a last line of defense (i.e., after engineering and administrative controls have been exhausted), and when any Action Limit (AL) or Occupational Exposure Limit (OEL) has been exceeded or when there is a possibility that an AL/OEL will be exceeded. Respiratory protection may be needed if a dust, aerosol or vapor hazard is present *and* work is conducted outside of the fume hood. If any procedure may pose an external hazard, it should be eliminated or strictly isolated**.**

**If a potential exposure hazard cannot be eliminated, contact the EH&S** [Respiratory Protection Program](https://www.ehs.washington.edu/workplace/respiratory-protection) **administrator at uwresp@uw.edu, or call 206.543.7388** **to discuss respiratory protection or to enroll in the program so a respiratory protection analysis can be performed**. Program enrollment includes medical evaluation, training and fit testing for an appropriate respirator. Where air-purifying respirators are appropriate, use a full-face respirator with appropriate respirator cartridges as a backup to engineering controls. Use a full-face supplied air respirator if it is the sole means of protection.

# Section 4 – Special handling and storage requirements

* Keep the container tightly closed when it is not in use.
* Prevent the formation of dust.
* DO NOT RINSE containers used to weigh and dispense sodium hydrosulfite with water.
* When work is completed, remove gloves and wash hands with soap and water.

More generally, users of chemicals are required to follow UW [labeling requirements](https://www.ehs.washington.edu/chemical/chemical-container-labels) when transferring chemicals to secondary containers and when labeling containers with chemical waste, UW-synthesized chemicals, [peroxide-forming chemicals](https://www.ehs.washington.edu/resource/ehs-guidelines-peroxide-forming-chemicals-168), and [Chemicals of Interest](https://www.cisa.gov/appendix-chemicals-interest). Requirements for labeling containers and templates for creating labels are available on the [EH&S website](http://www.ehs.washington.edu/chemical/chemical-container-labels).

Check [Section 2 of the Lab Safety Manual](https://www.ehs.washington.edu/resource/laboratory-safety-manual-510) and the [Chemical Compatibility Chart](https://www.ehs.washington.edu/system/files/resources/Incompatible_Chemicals_Focus_Sheet.pdf) on the EH&S website for incompatible chemical groups.

Special storage precautions may include keeping away from heat, light, air, flames, sources of ignition.

Check [Section 2 of the Lab Safety Manual](https://www.ehs.washington.edu/resource/laboratory-safety-manual-510) for information on chemical transport practices.

# Section 5 – Spill and accident procedures

Avoid breathing dust of sodium hydrosulfite.

Take the following steps in case of the following exposures:

* Inhalation: Move to fresh air. For advice, call the UW Employee Health Center (206-685-1026). For emergency help, call 911.
* Skin contact: Wash with soap and water. For advice, call the UW Employee Health Center (206-685-1026). For emergency help, call 911.
* Eye contact: Rinse with water at an eye-wash station for 15 minutes. For advice, call the UW Employee Health Center (206-685-1026). For emergency help, call 911.

If the spill is fully contained inside the fume hood, close the sash and prepare yourself to clean it up. Access the closest spill kit. Make sure you have the appropriate PPE on (lab coat, nitrile gloves, eye protection). Do not allow the substance to enter the drain. Put all generated waste into a bag if you have a lot of debris and a plastic container if you have only a small amount of debris. See Waste section below.

If the spill is outside of the hood, do not breathe dust and ensure adequate ventilation. Do not let anyone enter the contaminated space until the air is cleared or proper PPE has been donned. Grab the closest spill kit. Make sure you have the appropriate PPE on (lab coat, nitrile gloves, eye protection). Do not allow the substance to enter the drain. Put all generated waste into a bag if you have a lot of debris and a plastic container if only a small amount of debris. See Waste section below.

Do **not** attempt to clean up any spill if not comfortable doing so. Instead, evacuate the area and call 9-1-1 on campus phone for help. If the spill is out of control, call 9-1-1. If a person is injured, exposed or suspected of being exposed, call 9-1-1.

For questions on spill cleanup, contact EH&S spill consultants at 206‐543‐0467 during normal business hours (Monday-Friday, 8 a.m. to 5 p.m.).

Any spill, exposure or near miss incident requires the involved person or supervisor to complete and submit the [UW Online Accident Reporting System](https://oars.ehs.washington.edu/) (OARS) form on the EH&S website within 24 hours (certain [types of incidents require immediate notification](https://www.ehs.washington.edu/workplace/incident-reporting)).

**Get Help.**

* **Call** 9-1-1 or go to nearest Emergency Department (ED); provide details of exposure:
  + - Agent
    - Dose
    - Route of exposure
    - Time since exposure
* **Bring** **the SDS and this SOP** to the Emergency Department
* **Notify your supervisor** as soon as possible for assistance
* **Secure the area** before leaving; lock doors and indicate spill if needed

**Report the incident to Environmental Health & Safety**.

* **Notify** **EH&S immediately** after providing first aid and/or getting help.
  + During business hours (M‐F/8‐5), call 206‐543‐7262.
  + Outside of business hours, call 206‐685‐UWPD (8973) to be routed to EH&S Staff On Call.
* Any spill, exposure or near miss incident requires the involved person or supervisor to complete and submit the [UW Online Accident Reporting System](https://oars.ehs.washington.edu/) (OARS) form on the EH&S website within 24 hours (certain [types of incidents require immediate notification](https://www.ehs.washington.edu/workplace/incident-reporting)).

# Section 6 – Waste accumulation and disposal procedures

If you are cleaning up after a spill and have a bag of debris, ensure the bag is sealed and use multiple bags as needed. Complete an EH&S Hazardous Waste Label and adhere it to the bag. [Here are instructions for how to label chemical waste containers](https://www.ehs.washington.edu/system/files/resources/how-to-label-chemical-waste-containers.pdf).

Put all waste, solid or liquid, into a plastic container.. Complete an EH&S Hazardous Waste Label and adhere it to the bottle. [Here are instructions for how to label chemical waste containers](https://www.ehs.washington.edu/system/files/resources/how-to-label-chemical-waste-containers.pdf).

More generally, refer to the SDS and [UW Laboratory Safety Manual](https://www.ehs.washington.edu/resource/laboratory-safety-manual-510), Section 3 for guidance on waste handling, labeling, accumulation, storage and pickup.

Per [UW Administrative Policy Statement 11.2](https://www.washington.edu/admin/rules/policies/APS/11.02.html), the University of Washington Environmental Health & Safety Department has full responsibility for collection of hazardous waste for the University, all its campuses, and off-site locations; **University laboratories cannot contract with an outside vendor to collect hazardous waste.**

**Be aware that many laboratory accidents happen from inadvertent disposal of** [**incompatible wastes**](https://www.ehs.washington.edu/system/files/resources/Incompatible_Chemicals_Focus_Sheet.pdf) **into the same waste container.** Therefore, identify different waste streams as appropriate.

Manage chemical and hazardous chemical waste separately from other waste streams such as biohazardous waste. Never autoclave chemical waste because it can produce hazardous chemical vapors, aerosols, and explosive reactions.

**All chemical waste containers must be labeled** with a [UW Hazardous Waste Label](https://www.ehs.washington.edu/chemical/hazardous-chemical-waste-disposal). Refer to [How to Label Chemical Waste Containers](https://www.ehs.washington.edu/system/files/resources/how-to-label-chemical-waste-containers.pdf).

To request a collection of chemical waste, submit a form on the [Chemical Waste Disposal](https://www.ehs.washington.edu/chemical/hazardous-chemical-waste-disposal) webpage on the EH&S website or directly in [MyChem](https://www.ehs.washington.edu/chemical/mychem) inventory. Contact EH&S at 206.616.5835 or [chmwaste@uw.edu](mailto:chmwaste@uw.edu) with questions.

Work area decontamination procedures as appropriate for the chemical in use should be followed.

Visit the [Hazardous Material Disposal and Recycling](https://www.ehs.washington.edu/popular-services/hazardous-material-disposal-and-recycling) webpage on the EH&S website for information on disposing, recycling and surplusing materials.

# Section 7 – Protocol

Sodium hydrosulfite (also known as sodium dithionite) is typically used in our lab as a aqueous quencher of fluorescent dyes such as NBD, following standard protocols throughout the literature.

**NOTE:** Any deviation from standard literature protocols requires approval from Principal Investigator.

# Section 8 – Special Precautions for animal use (Not relevant)

This section is not applicable (“N/A”) because our lab does not use animals.

[**PARTICULARLY HAZARDOUS SUBSTANCE**](https://www.ehs.washington.edu/resource/particularly-hazardous-substances-655) **INVOLVED?**

**YES: Sections #9 to #11 are Mandatory.**

**NO: Sections #9 to #11 are Optional.**

# Section 9 – Approvals required

All staff working with sodium hydrosulfite (sodium dithionite) must be trained on this SOP prior to starting work. They must also review the chemical’s SDS, which is available through the Keller Laboratory website and EH&S.

**Section 10 – Decontamination**

• If the eyes or body of any person may have been exposed, a safety shower/eye wash should be immediately used. Personnel who are working with acrylamide must be aware of location of nearest Safety Shower/Eye Wash and verify that a current certification of performance tag is present.

• Personnel shall rinse exposed areas of skin and/or eyes with copious amounts of water for at least 15 minutes.

• All equipment, materials and work surfaces that have/ potentially have become contaminated shall be cleaned in accordance with those identified for small spill in Section 5.

# Section 11 – Designated area

* Chemicals in powder form can become airborne and may result in personal exposure and area contamination. Use care to avoid dispersing dust. Mixing or dispensing should be done within a fume hood.

# Section 12 – Documentation relevant to ALL Particularly Hazardous Substances

* Lab members are expected to review the laboratory’s inventory of chemicals to identify any “Particularly Hazardous” substances. The inventory appears in MyChem with the letters “P” or “B” in the column labeled “Reg”.
* Before working with any of the “Particularly Hazardous” substances, lab members must review the laboratory’s SOP for that substance to learn how to protect themselves from the hazards and how to enact emergency procedures.
* Ready access to SOPs and to a Safety Data Sheets for all Particularly Hazardous materials used in the Keller Lab are available through the Keller Lab website.
* If lab any lab member determines that the SOP should be revised or if the substance is being used in a way that is not covered in the SOP, the lab member should bring it to the attention of the P .and propose changes to this SOP.
* Lab members must attest (in a separate document that applies to all Particularly Hazardous substances) that they will adhere to the policies in this SOP.