Standard Operating Procedure

**Dinitrophenol**

*This is an SOP template and is not complete until: 1) lab specific information is entered into the box below 2) lab specific protocol/procedure is added to the protocol/procedure section and
3) SOP has been signed and dated by the PI and relevant lab personnel.*

 Print a copy and insert into your
*Laboratory Safety Manual* and *Chemical Hygiene Plan*.
Refer to instructions for assistance.

|  |  |
| --- | --- |
| **Department:** | Click here to enter text. |
| **Date SOP was written:** | Click here to enter a date. |
| **Date SOP was approved by PI/lab supervisor:** | Click here to enter a date. |
| **Principal Investigator:** | Click here to enter text. |
| **Internal Lab Safety Coordinator/Lab Manager:** | Click here to enter text. |
| **Lab Phone:** | Click here to enter text. |
| **Office Phone:** | Click here to enter text. |
| **Emergency Contact:** | Click here to enter text. |
| *(Name and Phone Number)* |
| **Location(s) covered by this SOP:** | Click here to enter text. |
| *(Building/Room Number)* |

**Type of SOP:** [ ]  Process [ ] Hazardous Chemical [x]  Hazardous Class

**Purpose**

Dinitrophenol is a highly flammable, toxic and Potentially Explosive Chemical (PEC). If not stored and handled properly, this can pose a serious threat to the health and safety of laboratory personnel, emergency responders and chemical waste handlers. Hence, it is important to follow safety protocols to handle this chemical.

Dinitrophenols are a class of manufactured chemicals that do not occur naturally in the environment. There are six different dinitrophenols. The most commercially important dinitrophenol, 2,4-dinitrophenol (DNP), is a yellow solid with no smell. It is used in making dyes, wood preservatives, explosives, insect control substances, and other chemicals, and as a photographic developer.

**Physical & Chemical Properties/Definition of Chemical Group**

CAS#: 2,3 DNP 🡪 66-56-8

 2,4 DNP 🡪 51-28-5

 2,5 DNP 🡪 329-71-5

2,6 DNP 🡪 573-56-8

3,4 DNP 🡪 577-71-9

Class: Potentially Explosive Chemical, Toxic

Molecular Formula: C6H4N2O5

Form (physical state): N/A

Color: N/A

Boiling point: 2,3 DNP 🡪 Not available

 2,4 DNP 🡪 Not available

 2,5 DNP 🡪 Not available

 2,6 DNP 🡪 Not available

 3,4 DNP 🡪 Not available

**Potential Hazards/Toxicity**

Very hazardous in case of ingestion, of inhalation. Hazardous in case of skin contact (irritant), of eye contact (irritant). Slightly hazardous in case of skin contact (sensitizer). Severe over-exposure can result in death.

**Personal Protective Equipment (PPE)**

**Respirator Protection**

A ½ or full face respirator equipped with appropriate cartridges should be used any time there is the potential for exposure to vapor and/or dust and a fume hood cannot be used.

Respirators should be used only under any of the following circumstances:

* As a last line of defense (i.e., after engineering and administrative controls have been exhausted).
* When Permissible Exposure Limit (PEL) has exceeded or when there is a possibility that PEL will be exceeded.
* Regulations require the use of a respirator.
* An employer requires the use of a respirator.
* There is potential for harmful exposure due to an atmospheric contaminant (in the absence of PEL)
* As PPE in the event of a chemical spill clean-up process

Lab personnel intending to use/wear a respirator mask must be trained and fit-tested by ORS and should contact occhealt@uga.edu. This is a UGA requirement described in more detail in the [UGA Respiratory Protection Plan](https://esd.uga.edu/sites/default/files/respiratoryprotection.pdf) and supported by the [Office of Research Occupational Health and Safety Program](https://research.uga.edu/ohsp/).

**Hand Protection**

Viton gloves must be worn while handling dinitrophenol, but nitrile gloves are also acceptable**.** Handle with gloves. Gloves must be inspected prior to use. 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.

NOTE: Consult with your preferred glove manufacturer to ensure that the gloves you plan on using are compatible with dinitrophenol.

Refer to glove selection chart from the links below:

<http://www.ansellpro.com/download/Ansell_8thEditionChemicalResistanceGuide.pdf>

OR

<http://www.allsafetyproducts.biz/page/74172>

OR

<http://www.showabestglove.com/site/default.aspx>

OR

<http://www.mapaglove.com/>

**Eye Protection**

Wear ANSI approbed protective eyeglasses or chemical safety goggles.

**Skin and Body Protection**

Lab coats should be worn. These laboratory coats must be appropriately sized for the individual and be buttoned to their full length. Laboratory coat sleeves must be of a sufficient length to prevent skin exposure while wearing gloves. Full length pants and close-toed shoes must be worn at all times by all individuals that are occupying the laboratory area. The area of skin between the shoe and ankle should not be exposed.

**Hygiene Measures**

Wash thoroughly after handling. Wash hands before eating. Remove contaminated clothing and wash before reuse

**Engineering Controls**

Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low. Dinitrophenol must be only used in a fume hood. It is never to be used outside of a fume hood.

**First Aid Procedures**

**If inhaled**

May be fatal if inhaled. Causes respiratory tract irritation. May cause effects similar to those described for ingestion. Signs and symptoms of acute poisoning in humans include nausea, restlessness, flushed skin, sweating, rapid respiration, tachycardia, fever, cyanosis, and finally, collapse and coma. If the acute phase of poisoning is survived, the patient usually tolerates later complications, which may include renal insufficiency and toxic hepatitis.

**In case of skin contact**

Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.

**In case of eye contact**

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid.

**If swallowed**

Call the poison control center at 1-800-222-1222. If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

**Special Handling and Storage Requirements**

**Precautions for safe handling**

Wash thoroughly after handling. Wash hands before eating. Remove contaminated clothing and wash before reuse. Use only in a well-ventilated area. Ground and bond containers when transferring material. Do not get in eyes, on skin, or on clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Do not ingest or inhale. Store protected from light. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

**Conditions for safe storage**

Store in a cool place in the original container and protect from sunlight. Store in a tightly closed container. Material can ignite if dry. Do not allow material to completely dry. Keep container closed to prevent drying out.

**Spill and Accident Procedure**

**Chemical Spill Dial 911**

**24-7 On-Call Response to Research, Environment, Health or Safety Concerns Dial 2-5561 from a campus phone or 706-542-5561 from a non-campus line.**

**Spill** – Follow the procedures set out in the [UGA Chemical and Laboratory Safety Manual.](http://research.uga.edu/docs/units/safety/manuals/Chemical-Laboratory-Safety-Manual.pdf)

[If there are any chemical-specific protocols for responding to a spill, insert them here or mark “none”:]

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# **Medical Emergency Dial 911**

**Life Threatening Emergency, After Hours, Weekends And Holidays** – Dial **911** or the emergency phone numbers listed at the beginning of the UGA Chemical and Laboratory Safety Manual

*Note: All incidents that result in an injury or property damage must be reported to ORS / ESD using a University Incident/Accident Report.*

**Non-Life Threatening Emergency** – Follow the instructions in the UGA Chemical and Laboratory Safety Manual.

*Note: All incidents that result in an injury or property damage must be reported to ORS / ESD using a University Incident/Accident Report.*

**Decontamination/Waste Disposal Procedure**

**For general hazardous waste disposal procedures, see Appendix H of the UGA Chemical and Laboratory Safety Manual.**

**Chemical Specific Procedures: [to be inserted or marked as “none”]**

Vacuum or sweep up material and place into a suitable disposal container. Reduce airborne dust and prevent scattering by moistening with water. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Remove all sources of ignition. Use a spark-proof tool. If the material is dry, explosives experts may be necessary to dispose of the spill. Provide ventilation. Wearing proper PPE, please decontaminate equipment and bench tops using soap and water. Please dispose of the used dinitrophenol and disposables contaminated with dinitrophenol as hazardous waste.

**Safety Data Sheet (SDS) Location**

UGA personnel can access Online SDS through a link in the upper left corner of the ESD home page (<https://esd.uga.edu>) and logging in by using their UGA email user name and password.

**Protocol/Procedure (Add lab specific Protocol/Procedure here)**

Click here to enter text.

**NOTE**

Any deviation from this SOP requires approval from PI.

**Documentation of Training** (signature of all users is required)

* Prior to conducting any work with dinitrophenol, designated personnel must provide training to his/her laboratory personnel specific to the hazards involved in working with this substance, work area decontamination, and emergency procedures.
* The Principal Investigator must provide his/her laboratory personnel with a copy of this SOP and access to the SDS provided by the manufacturer.
* The Principal Investigator must ensure that his/her laboratory personnel have attended appropriate laboratory safety training or refresher training within the last 12 months.

**Principal Investigator SOP Approval**

Print name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Signature\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Approval Date:

I have read and understand the content of this SOP:

|  |  |  |
| --- | --- | --- |
| **Name** | **Signature** | **Date** |
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