

Environmental Assessment Program

Standard Operating Procedure for Collecting Freshwater Suspended Particulate Matter
Samples using In-Line Filtration

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Date - 10/31/14

EAP041

Approved

Recertified: 10/31/14

SIGNATURES ON FILE

Please note that the Washington State Department of Ecology's Standard Operating Procedures (SOPs) are adapted from published methods, or developed by in-house technical and administrative experts. Their primary purpose is for internal Ecology use, although sampling and administrative SOPs may have a wider utility. Our SOPs do not supplant official published methods. Distribution of these SOPs does not constitute an endorsement of a particular procedure or method.

Any reference to specific equipment, manufacturer, or supplies is for descriptive purposes only and does not constitute an endorsement of a particular product or service by the author or by the Department of Ecology.

Although Ecology follows the SOP in most instances, there may be instances in which Ecology uses an alternative methodology, procedure, or process.

SOP Revision History

Revision Date	Rev number	Summary of changes	Sections	Reviser(s)
10/17/11	V1.0	Recertified		Kammin
10/31/14	V1.1	Updated Attachment 1 (MSDS)	11.0	C. Mathieu
10/31/14	V1.1	Recertified		C. Mathieu

Environmental Assessment Program

Standard Operating Procedure for Collecting Freshwater Suspended Particulate Matter Samples using In-Line Filtration

1.0 Purpose and Scope

- 1.1 This document is the Environmental Assessment Program (EAP) Standard Operating Procedure (SOP) for collecting freshwater Suspended Particulate Matter (SPM) samples using an in-line filtration system. This SOP covers collection of freshwater SPM on membrane filters for subsequent chemical analyses.

2.0 Applicability

- 2.1 This SOP was developed for SPM collection within the Department of Ecology's (Ecology) Toxics Studies Unit (TSU) for lead analysis as part of the Trend Monitoring Component for Organic PBTs in the Washington State Toxics Monitoring Program study (Johnson, 2007; Meredith and Furl, 2008 in press). This SOP is applicable to other TSU studies collecting SPM using in-line filtration for the purpose of metals analyses.

3.0 Definitions

- 3.1 Peristaltic pump – A mechanical pump that uses positive displacement to push fluid through tubing. Sample water never contacts the pump head, only the tubing.
- 3.2 EAP – Environmental Assessment Program
- 3.3 Ecology – Washington State Department of Ecology
- 3.4 In-line filtration – A filtration system using an in-line filter holder attached to the outflow tubing of a peristaltic pump. Pressure is used to pass water through the filter, collecting particulates on the filter surface. A 0.45 μm pore-size filter is often used as a distinction point between particulate ($\geq 0.45 \mu\text{m}$) and dissolved ($< 0.45 \mu\text{m}$) components in the water (Horowitz, 1986; Odman et al., 1999; Bibby and Webster-Brown, 2006; Odman et al., 2006).
- 3.5 MEL – Manchester Environmental Laboratory
- 3.6 QAPP – Quality Assurance Project Plan
- 3.7 SPM – Suspended Particulate Matter

3.8 SPMD – Semipermeable Membrane Device

3.9 TSU – Toxics Studies Unit

4.0 Personnel Qualifications/Responsibilities

4.1 The field lead will direct sampling activities in accordance with the project specific Quality Assurance Project Plan (QAPP). The field lead is responsible for training field crew and establishing sampling goals and objectives. All crew members involved in SPM sampling using in-line filtration for metal analysis should follow this SOP for sample collection.

4.2 All field staff must be familiar with the EAP Field Safety Manual (Ecology, 2006b). The field lead should complete and file a field work plan and a float plan, when applicable.

4.3 When sampling from a boat, a qualified Ecology boat operator must be on board. Boat operators and field crew must have completed the training requirements specified in EAP's Field Safety Manual (Ecology, 2006b).

5.0 Equipment, Reagents, and Supplies

5.1 Field Equipment

5.1 Peristaltic pump

5.2 12V battery

5.3 Flex tubing (silastic) – flexible tubing that is threaded through the peristaltic pump head. The flexibility of the tubing allows the pump rollers to push fluid through the pump without touching the fluid directly.

5.4 Polyethylene tubing – rigid tubing that is attached to the flex tubing on one end and deployed into waterbody at the other; 6 – 25 feet in length.

5.5 47 mm membrane in-line Teflon filter holders

5.6 0.45 um pore size, 47 mm membrane nitrocellulose filters

5.7 Filter carriers

5.8 Teflon tape

5.9 Forceps

5.10 Channel locks

5.11 Scissors

5.12 Duct tape

5.13 Zip ties

5.14 Stakes

5.15 PVC extension device

5.16 1 L graduated cylinder

5.17 Timing watch

5.18 Cooler with ice

- 5.19 GPS unit
- 5.20 Field Notebook
- 5.21 Pencils and erasers
- 5.22 Cell phone

- 5.23 **Decontamination Equipment**
 - 5.23.1 10% Trace Metal Grade Nitric Acid (see Attachment 1 for MSDS)
 - 5.23.2 Waste bucket with screw-tight lid
 - 5.23.3 Deionized water
 - 5.23.4 Fisherbrand Polypropylene 500mL Wash bottles for 10% nitric acid and deionized water
 - 5.23.5 Aluminum foil

6.0 Summary of Procedures

6.1 Decontamination Procedures

- 6.1.1 Tubing, filter holders, forceps, and all other materials coming into contact with the SPM samples must be decontaminated before sampling and between sampling locations. The following decontamination procedures should be carried out for metals analyses.
- 6.1.2 Rinse filter holders and forceps with a 10% nitric acid solution. For tubing decontamination, pump the 10% nitric acid solution through the tubing using a peristaltic pump.
- 6.1.3 Follow with a deionized water rinse. Rinse filter holders and forceps with deionized water. Rinse tubing by pumping deionized water through system.
- 6.1.4 Allow equipment to air dry. If possible, dry equipment in a laboratory drying hood.
- 6.1.5 Wrap decontaminated equipment in aluminum foil, with the dull side facing the equipment, until use in the field.

6.2 Sampling Procedures

- 6.2.1 The following procedure describes the collection of freshwater SPM samples for metals analyses. This type of sampling can be conducted from a boat or from shore using a PVC extension device to collect samples away from the boat or shoreline with the intake facing flowing water. The PVC extension device is used to suspend the intake of the tubing off of bottom sediments and below the water surface. The following summary applies to river and lake sampling.

- 6.2.2 All crew members should wear nitrile gloves while sampling. A field blank should be collected prior to sampling to evaluate potential contamination from equipment.
- 6.2.3 Attach the polyethylene tubing to the receiving end of the flex tubing (Figure 2) by fitting the flex tubing over the outside of the polyethylene tubing. The Flex tubing should overlap the polyethylene tubing at least 2 inches, creating a watertight seal.

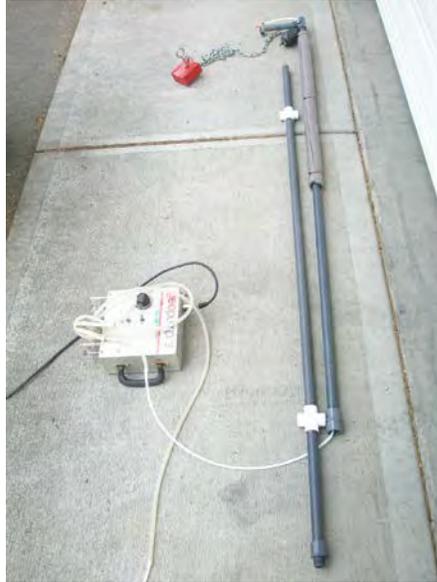


Figure 2. Polyethylene tubing, flex tubing, and PVC extension device.

- 6.2.4 Thread the polyethylene tubing through the PVC extension device and secure the intake end of the tubing to the arm of the PVC extension device using zip ties. This arm is at a right-angle bend at the far end of the PVC extension device (Figure 3) and is used to ensure that the tubing intake is always facing towards the current flow. Make sure that the tubing is not pinched at the right-angle turn.



Figure 3. Arm at receiving end of PVC extension device.

- 6.2.5 Deploy the PVC extension device with the attached polyethylene tubing into the waterbody to be sampled, 6 – 12 feet away from shore, towards the center of the channel or lake, with the tubing intake facing towards the current (Figure 4). Make sure that the tubing intake is suspended above the bottom substrate and 2 – 6 feet below the water surface. Secure the tubing holder to the shore using stakes or weights if necessary.



Figure 4. Deploying the PVC extension device with attached polyethylene tubing.

- 6.2.6 When sampling in conjunction with Semipermeable Membrane Devices (SPMDs), sample in a location upstream from the SPMD deployment.
- 6.2.7 Attach the 47 mm membrane in-line Teflon filter holder to the outflow of the flex tubing using a short piece of polyethylene tubing to connect the two (Figure 5). The arrows on the filter holder should point in the direction of flow.



Figure 5. Filter holder attached to the outflow flex tubing.

- 6.2.8 Attach the pump to a 12v battery and turn the on the peristaltic pump. The arrow switch on the pump must be pointing towards the intake tubing (Figure 6). Let the river or lake water run through the tubing for 30 seconds and turn off pump. Do this step before the filter is placed inside the filter holder, in order to flush the equipment with ambient water.



Figure 6. Peristaltic pump settings; the large black button on the left controls the pump speed, the top switch controls the power, and the bottom switch controls the direction of flow (arrow switch).

- 6.2.9 Remove the bottom half of the filter holder. A second crew member, wearing clean nitrile gloves and using decontaminated forceps, should carefully place the 0.45 μm pore-size 47 mm membrane nitrocellulose filter inside of the filter holder. Screw the bottom half of the filter holder back onto the filtering apparatus.
- 6.2.10 Arrange the filter holder so that the filtrate will flow downwards, into a graduated cylinder (Figure 7). The filtrate volume caught in the graduated cylinder will be recorded, along with start and end time of filtration.



Figure 7. Filter holder in line with the graduated cylinder catching the filtrate.

- 6.2.11 Turn the peristaltic pump on again.
- 6.2.12 Start the timing watch when water reaches the filter.
- 6.2.13 Once filters have accumulated enough SPM to restrict the water flow of the filtrate remove the intake tubing from the waterbody. This should be done just before the filtrate outflow is reduced to a drip. Let the pump continue to run until the rest of the sample water has passed through the tubing and chamber of the filter holder.
- 6.2.14 Turn off the peristaltic pump. Stop the timing watch and record the filtration time.
- 6.2.15 Measure the filtrate in the graduated cylinder and record the volume of water that passed through the filter.
- 6.2.16 Remove the bottom half of the filter holder. A second crew member wearing clean nitrile gloves should remove the filter using decontaminated forceps.
- 6.2.17 Place the filter in the appropriate container with the SPM side up. If using laboratory-issued containers, make sure to put the filter back into the same labeled container it came in.
- 6.2.18 Handle the filter and filter-container with decontaminated forceps or clamps only and do not touch with hands.
- 6.2.19 Place the sample container inside the carrier box. The carrier box holding the samples should then be placed inside the cooler with ice. A plastic bag should cover the outside of the carrier box to protect it from wet ice. It is important that samples be held and stored upright inside the carrier box and that the carrier box itself always remain upright.
- 6.2.20 Store the samples at 4° C until shipment for analyses. The holding time for lead SPM samples is 6 months.

7.0 Records Management

- 7.1 The following field notes should be recorded at each sampling location:
- 7.2 Date
- 7.3 Time
- 7.4 Crew members' names
- 7.5 Location/site name
- 7.6 Geographic coordinates

- 7.7 Weather
- 7.8 Sampling location description
- 7.9 Tide height (when sampling rivers with tidal influence)
- 7.10 SPM sample ID numbers (MEL issued ID # and Field ID#)
- 7.11 Filtration time
- 7.12 Filtrate volume
- 7.13 Additional observations
- 7.14 All field notes and recorded data should be kept and maintained by the field lead. Data should be maintained in accordance with the project Quality Assurance Project Plan (QAPP).

8.0 Quality Control and Quality Assurance

- 8.1 Field quality control samples should be taken in accordance with the project QAPP. Typically one field blank and one field replicate should be taken for every 10% of sampling locations.
- 8.2 Field blanks are taken using the same method of collection as a field sample, but filtering lab-purified blank water instead of river or lake water. Lab-purified blank water will be provided by Manchester Environmental Laboratory (MEL). The lab-purified blank water is taken to the sampling location and the field blank process is done in the field.
- 8.3 The field lead should consult MEL to decide which laboratory quality control samples will be analyzed. Typically, one method blank per batch and one check standard per batch are analyzed. Because the samples are comprised of individual filters, laboratory duplicates are not possible for this sampling method.
- 8.4 Final sample results can be calculated through dividing the concentration on the filter by either the dry weight of the adhered filter material or the filtrate volume. The field lead should consult with MEL on result reporting.

9.0 Safety

- 9.1 All crew members should be familiar with, and follow, the protocols described in the EAP Field Operations and Safety Manual (Ecology, 2006b). Particular attention should be given to chapters 1 and 3, *General Field Work* and *Boating*.
- 9.2 Crew members carrying out the decontamination procedure should be familiar with Ecology's Chemical Hygiene Plan & Hazardous Materials Management Plan (Ecology, 2006a).

10.0 References

- 10.1 Bibby, R. and J. Webster-Brown. 2006. Trace Metal Adsorption onto Urban Stream Suspended Particulate Matter (Auckland Region, New Zealand). *Appl. Geochem.*, Vol. 21: 1135-1151.
- 10.2 Ecology. 2006a. Chemical Hygiene Plan & Hazardous Materials Management Plan. Washington State Department of Ecology, Olympia, WA.
- 10.3 Ecology. 2006b. Environmental Assessment Program Safety Manual. Washington State Department of Ecology, Olympia, WA.
- 10.4 Johnson, A. 2007. Quality Assurance Project Plan: A Trend Monitoring Component for Organic PBTs in the Washington State Toxics Monitoring Program. Washington State Department of Ecology, Olympia, WA. Pub. No. 07-03-104.
<https://fortress.wa.gov/ecy/publications/summarypages/0703104.html>.
- 10.5 Horowitz, A. 1986. Comparison of Methods for the Concentration of Suspended Sediment in River Water for Subsequent Chemical Analysis. *Environ. Sci. Technol.*, Vol. 20; 155-160.
- 10.6 Meredith, C. and C. Furl. 2008. Addendum #1 to Quality Assurance Project Plan: A Trend Monitoring Component for Organic PBTs in the Washington State Toxics Monitoring Program. Washington State Department of Ecology, Olympia, WA. In press.
- 10.7 Odman, F., T. Ruth, C. Ponter. 1999. Validation of a Field Filtration Technique for Characterization of Suspended Particulate Matter from Freshwater. Part I. Major Elements. *Appl. Geochem.*, Vol. 14; 301-317.
- 10.8 Odman, F., T. Ruth, I. Rodushkin, C. Ponter. 2006. Validation of a Field Filtration Technique for Characterization of Suspended Particulate Matter from Freshwater. Part II. Minor, Trace, and Ultra Trace Elements. *Appl. Geochem.*, Vol. 21: 2112-2134.

11.0 Attachment 1. MSDS for Nitric Acid from Avantor Performance Materials, Inc.

NITRIC ACID 10% R. S.

1. Product Identification

Synonyms: Aqua Fortis; Azotic Acid
CAS No.: 7697-37-2
Molecular Weight: 63.01
Chemical Formula: HNO₃ (10% solution)
Product Codes: H262

2. Composition/Information on Ingredients

Ingredient CAS No Percent Hazardous

Nitric Acid 7697-37-2 10% Yes
Water 7732-18-5 90% No

3. Hazards Identification

Emergency Overview

POISON! DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. OXIDIZER. CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE. MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED. INHALATION MAY CAUSE LUNG AND TOOTH DAMAGE.

SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Poison)
Flammability Rating: 0 - None
Reactivity Rating: 2 -
Contact Rating: 4 - Extreme (Corrosive)
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD;
PROPER GLOVES
Storage Color Code: White (Corrosive)

Potential Health Effects

Nitric acid is extremely hazardous; it is corrosive, reactive, an oxidizer, and a poison.

Inhalation:

Corrosive! May cause irritation of the nose, throat, and respiratory tract including coughing and choking. Higher concentrations or prolonged exposure to vapors of nitric acid may lead to pneumonia or pulmonary edema.

Ingestion:

Corrosive. May cause immediate pain and burns of the mouth, throat, esophagus and gastrointestinal tract.

Skin Contact:

Corrosive! May cause redness, pain, and severe skin burns.

Eye Contact:

Corrosive! Vapors are irritating and may cause damage to the eyes. Contact may cause severe burns and permanent eye damage.

Chronic Exposure:

Long-term exposure to concentrated vapors may cause erosion of teeth. Long term exposures seldom occur due to the corrosive properties of the acid.

Aggravation of Pre-existing Conditions:

Persons with pre-existing skin disorders, eye disease, or cardiopulmonary diseases may be more susceptible to the effects of this substance.

4. First Aid Measures

Immediate first aid treatment reduces the health effects of this substance.

Inhalation:

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

Ingestion:

DO NOT INDUCE VOMITING! Give large quantities of water or milk if available. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Skin Contact:

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Call a physician.

Eye Contact:

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. Fire Fighting Measures

Fire:

Not combustible, but substance is a strong oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition. Can react with metals to release flammable hydrogen gas.

Explosion:

May react explosively with combustible organic or readily oxidizable materials such as: alcohols, turpentine, charcoal, organic refuse, metal powder, hydrogen sulfide, etc.

Fire Extinguishing Media:

Water or water spray.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Increases the flammability of combustible, organic and readily oxidizable materials.

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering.

Contain and recover liquid when

possible. Neutralize with alkaline material (soda ash, lime), then absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

7. Handling and Storage

Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product. Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Separate from combustible, organic, or any other readily oxidizable materials. Protect from freezing.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

For Nitric Acid:

OSHA Permissible Exposure Limit (PEL):

2 ppm (TWA)

ACGIH Threshold Limit Value (TLV):

2 ppm (TWA); 4 ppm (STEL)

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded and engineering controls are not feasible, wear a supplied air, full-facepiece respirator, airlined hood, or full-facepiece self-contained breathing apparatus.

Breathing air quality must meet the requirements of the OSHA respiratory protection standard (29CFR1910.134). Canister-type respirators using sorbents are ineffective.

Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection:

Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:

Clear to pale yellow solution.

Odor:

Suffocating, acrid.

Solubility:

Infinitely soluble.

Density:

1.054

pH:

No information found.

% Volatiles by volume @ 21C (70F):

100 (as water and acid)

Boiling Point:

ca. 101C (ca. 214F)

Melting Point:

ca. -3C (ca. 27F)

Vapor Density (Air=1):

No information found.

Vapor Pressure (mm Hg):

No information found.

Evaporation Rate (BuAc=1):

No information found.

10. Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage.

Hazardous Decomposition Products:

When heated to decomposition, emits toxic nitrogen oxides fumes and hydrogen nitrate.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

Strong bases, metallic powders, carbides, hydrogen sulfide, turpentine, and combustible organics.

Conditions to Avoid:

Heat and incompatibles.

11. Toxicological Information

For Nitric Acid: Investigated as a mutagen and reproductive effector.

-----\Cancer Lists\-----

---NTP Carcinogen---

Ingredient Known Anticipated IARC Category

Nitric Acid (7697-37-2) No No None

Water (7732-18-5) No No None

12. Ecological Information

Environmental Fate:

No information found.

Environmental Toxicity:

No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Although not a listed RCRA hazardous waste, this material may exhibit one or more characteristics of a hazardous waste and require appropriate analysis to determine specific disposal requirements. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: NITRIC ACID (WITH 10% NITRIC ACID)

Hazard Class: 8
UN/NA: UN2031
Packing Group: II
Information reported for product/size: 2.5L
International (Water, I.M.O.)

Proper Shipping Name: NITRIC ACID (WITH 10% NITRIC ACID)
Hazard Class: 8
UN/NA: UN2031
Packing Group: II
Information reported for product/size: 2.5L

15. Regulatory Information

-----\Chemical Inventory Status - Part 1\-----

Ingredient TSCA EC Japan Australia

Nitric Acid (7697-37-2) Yes Yes Yes Yes
Water (7732-18-5) Yes Yes Yes Yes

-----\Chemical Inventory Status - Part 2\-----

--Canada--

Ingredient Korea DSL NDSL Phil.

Nitric Acid (7697-37-2) Yes Yes No Yes
Water (7732-18-5) Yes Yes No Yes

-----\Federal, State & International Regulations - Part 1\-----

-SARA 302- -----SARA 313-----

Ingredient RQ TPQ List Chemical Catg.

Nitric Acid (7697-37-2) 1000 1000 Yes No
Water (7732-18-5) No No No No

-----\Federal, State & International Regulations - Part 2\-----

-RCRA- -TSCAIngredient
CERCLA 261.33 8(d)

Nitric Acid (7697-37-2) 1000 No No
Water (7732-18-5) No No No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: Yes (Mixture / Liquid)

Australian Hazchem Code: 2PE

Poison Schedule: S6

WHMIS:

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: **3** Flammability: **0** Reactivity: **0** Other: **Oxidizer**

Label Hazard Warning:

POISON! DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. OXIDIZER. CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE. MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED. INHALATION MAY CAUSE LUNG AND TOOTH DAMAGE.

Label Precautions:

Do not get in eyes, on skin, or on clothing. Do not breathe vapor or mist. Use only with adequate ventilation. Wash thoroughly after handling. Store in a tightly closed container. Remove and wash contaminated clothing promptly.

Label First Aid:

In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In all cases call a physician.

Product Use:

Laboratory Reagent.

Revision Information:

No Changes.

Disclaimer:

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Prepared by: Environmental Health & Safety