SAFETY DATA SHEET

Issue Date 19-May-2016 Revision Date 10-Aug-2016 Version 4 Page 1 / 17

1. IDENTIFICATION

Product identifier
Product Name Phosphorus LR TNT Reagent A

Other means of identification
Product Code(s) TNT843A

Safety data sheet number M02444

UN/ID no 3316

Component of Kits or Sets 2925000; 2925100; 2925100K; TNT843;

Recommended use of the chemical and restrictions on use
Recommended Use Laboratory reagent.
Uses advised against None.
Restrictions on use None.

Details of the supplier of the safety data sheet

Manufacturer Address
Hach Company
P.O.Box 389 Loveland, CO 80539 USA
(970) 669-3050

Emergency telephone number
(303) 623-5716 - 24 Hour Service (515)232-2533 - 8am - 4pm CST

Product Information

Chemical Name Not applicable
Formula Not applicable
CAS No Not applicable
Alternate CAS Number Not applicable
NIOSH (RTECS) Number None reported

2. HAZARDS IDENTIFICATION

Classification

Regulatory Status
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

<table>
<thead>
<tr>
<th>Hazardous Property</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute toxicity - Oral</td>
<td>Category 4</td>
</tr>
<tr>
<td>Skin corrosion/irritation</td>
<td>Category 2</td>
</tr>
<tr>
<td>Serious eye damage/eye irritation</td>
<td>Category 2A</td>
</tr>
<tr>
<td>Respiratory sensitization</td>
<td>Category 1</td>
</tr>
<tr>
<td>Skin sensitization</td>
<td>Category 1</td>
</tr>
<tr>
<td>Reproductive toxicity</td>
<td>Category 2</td>
</tr>
<tr>
<td>Specific target organ toxicity (single exposure)</td>
<td>Category 3</td>
</tr>
</tbody>
</table>

Hazard not otherwise classified (HNOC)
Not applicable

Label elements

Signal word - Danger
Hazard statements
H302 - Harmful if swallowed
H315 - Causes skin irritation
H317 - May cause an allergic skin reaction
H319 - Causes serious eye irritation
H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled
H335 - May cause respiratory irritation
H361 - Suspected of damaging fertility or the unborn child

P201 - Obtain special instructions before use
P202 - Do not handle until all safety precautions have been read and understood
P281 - Use personal protective equipment as required
P264 - Wash face, hands and any exposed skin thoroughly after handling
P270 - Do not eat, drink or smoke when using this product
P261 - Avoid breathing dust/fume/gas/mist/vapors/spray
P284 - Wear respiratory protection
P272 - Contaminated work clothing should not be allowed out of the workplace
P280 - Wear protective gloves
P271 - Use only outdoors or in a well-ventilated area
P308 + P313 - If exposed or concerned: Get medical advice/attention
P342 + P311 - If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician
P304 + P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P337 + P313 - If eye irritation persists: Get medical advice/attention
P302 + P352 - IF ON SKIN: Wash with plenty of soap and water
P362 - Take off contaminated clothing and wash before reuse
P333 + P313 - If skin irritation or rash occurs: Get medical advice/attention
P301 + P312 - IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell
P330 - Rinse mouth
P405 - Store locked up
P403 + P233 - Store in a well-ventilated place. Keep container tightly closed
P501 - Dispose of contents/container to an approved waste disposal plant

Other Information
Harmful to aquatic life

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance
Not applicable

Mixture

Percent ranges are used where confidential product information is applicable.

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS No</th>
<th>Percent</th>
<th>HMRIC #</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Sodium persulfate</th>
<th>7775-27-1</th>
<th>50 - 100</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boric acid (HBO2), sodium salt, tetrahydrate</td>
<td>10555-76-7</td>
<td>10 - 30</td>
<td>-</td>
</tr>
<tr>
<td>Lithium sulfate monohydrate</td>
<td>10102-25-7</td>
<td>5 - 10</td>
<td>-</td>
</tr>
</tbody>
</table>

### 4. FIRST AID MEASURES

**Description of first aid measures**

**General advice**
Do not breathe dust/fume/gas/mist/vapors/spray. Do not get in eyes, on skin, or on clothing. IF exposed or concerned: Get medical advice/attention.

**Eye contact**
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If symptoms persist, call a physician.

**Skin contact**
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. If skin irritation persists, call a physician. Wash contaminated clothing before reuse.

**Inhalation**
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician.

**Ingestion**
Rinse mouth. Call a POISON CENTER or doctor/physician if you feel unwell.

**Self-protection of the first aider**
Use personal protective equipment as required. Avoid contact with skin, eyes or clothing.

**Most important symptoms and effects, both acute and delayed**

**Symptoms**
See Section 11: TOXICOLOGICAL INFORMATION.

**Indication of any immediate medical attention and special treatment needed**

**Note to physicians**
Treat symptomatically.

### 5. FIRE-FIGHTING MEASURES

**Suitable Extinguishing Media**
Use media appropriate to surrounding fire conditions. Water.

**Unsuitable extinguishing media**
No information available.

**Flammable properties**
Material is not classified as flammable according to GHS criteria.

**Specific hazards arising from the chemical**
Thermal decomposition can lead to release of irritating and toxic gases and vapors. In the event of fire and/or explosion do not breathe fumes.

**Hazardous combustion products**
Sulfur oxides. Boron compounds. Sodium oxides.

**Protective equipment and precautions for firefighters**
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

### 6. ACCIDENTAL RELEASE MEASURES

**U.S. Notice**
Only persons properly qualified to respond to an emergency involving hazardous substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company’s emergency response plan and
guidelines/procedures. See Section 13, Special Instructions for disposal assistance. Outside of the US, only persons properly qualified according to state or local regulations should respond to a spill involving chemicals.

**EC Notice**

Only persons properly qualified to respond to an emergency involving hazardous substances should respond to a spill involving chemicals. See Section 13, Special Instructions for disposal assistance.

**WHMIS Notice**

Only persons properly qualified to respond to an emergency involving hazardous substances should respond to a spill involving chemicals. See Section 13, Special Instructions for disposal assistance.

**Personal precautions, protective equipment and emergency procedures**

**Personal precautions**

Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Use personal protective equipment as required.

**For emergency responders**

Use personal protection recommended in Section 8.

**Environmental precautions**

Prevent further leakage or spillage if safe to do so. Prevent product from entering drains. Prevent entry into waterways, sewers, basements or confined areas. See Section 12 for additional ecological information.

**Methods and material for containment and cleaning up**

**Methods for containment**

Stop spilled material from being released to the environment. Cover spilled solid material with sand or other inert material.

**Methods for cleaning up**

Use personal protective equipment as required. Cover powder spill with plastic sheet or tarp to minimize spreading and keep powder dry. Take up mechanically, placing in appropriate containers for disposal. Clean contaminated surface thoroughly. Dispose of in accordance with local, state and federal regulations or laws.

**Emergency Response Guide Number**

Not applicable

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### 7. HANDLING AND STORAGE

**Precautions for safe handling**

Use personal protective equipment as required. Avoid contact with skin, eyes or clothing. Do not breathe dust/fume/gas/mist/vapors/spray. In case of insufficient ventilation, wear suitable respiratory equipment. Do not eat, drink or smoke when using this product.

**Advice on safe handling**

Keep containers tightly closed in a dry, cool and well-ventilated place. Keep out of the reach of children. Keep in properly labeled containers.

**Conditions for safe storage, including any incompatibilities**

**Flammability class**

Not applicable

**Incompatible materials**

Aluminum. Reducing agent.

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### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Control parameters**

**Exposure Guidelines**

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>NIOSH IDLH</th>
</tr>
</thead>
</table>

---
<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Alberta OEL</th>
<th>British Columbia OEL</th>
<th>Manitoba OEL</th>
<th>New Brunswick OEL</th>
<th>New Foundland &amp; Labrador OEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium persulfate 50 - 100</td>
<td>TWA: 0.1 mg/m³</td>
<td>TWA: 0.1 mg/m³</td>
<td>TWA: 0.1 mg/m³</td>
<td>TWA: 0.1 mg/m³</td>
<td>TWA: 0.1 mg/m³</td>
</tr>
<tr>
<td>Boric acid (HBO₂), sodium salt, tetrahydrate 10 - 30</td>
<td>NDF</td>
<td>TWA: 2 mg/m³</td>
<td>TWA: 2 mg/m³</td>
<td>TWA: 2 mg/m³</td>
<td>TWA: 2 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>STEL: 6 mg/m³</td>
<td>STEL: 6 mg/m³</td>
<td></td>
<td>STEL: 6 mg/m³</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Northwest Territories OEL</th>
<th>Nova Scotia OEL</th>
<th>Nunavut OEL</th>
<th>Ontario TWA</th>
<th>Prince Edward Island OEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium persulfate 50 - 100</td>
<td>TWA: 0.1 mg/m³</td>
<td>TWA: 0.1 mg/m³</td>
<td>TWA: 0.1 mg/m³</td>
<td>TWA: 0.1 mg/m³</td>
<td>TWA: 0.1 mg/m³</td>
</tr>
<tr>
<td>Boric acid (HBO₂), sodium salt, tetrahydrate 10 - 30</td>
<td>STEL: 0.3 mg/m³</td>
<td>STEL: 6 mg/m³</td>
<td>NDF</td>
<td>NDF</td>
<td>STEL: 6 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA: 2 mg/m³</td>
<td></td>
<td></td>
<td>TWA: 2 mg/m³</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Quebec OEL</th>
<th>Saskatchewan OEL</th>
<th>Yukon OEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium persulfate 50 - 100</td>
<td>NDF</td>
<td>TWA: 0.1 mg/m³</td>
<td>NDF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>STEL: 0.3 mg/m³</td>
<td></td>
</tr>
</tbody>
</table>

Legend
See section 16 for terms and abbreviations

**Appropriate engineering controls**

Engineering Controls
- Showers
- Eyewash stations
- Ventilation systems

**Individual protection measures, such as personal protective equipment**

Eye/face protection
- Tight sealing safety goggles. Face protection shield.

Skin and body protection
- Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact. Wear chemical resistant clothing such as gloves, apron, boots or whole bodysuits made from neoprene, as appropriate. Rubber boots. Gloves made of plastic or rubber.

Respiratory protection
- In case of insufficient ventilation, wear suitable respiratory equipment.

General Hygiene Considerations
- Use personal protective equipment as required. Avoid contact with skin, eyes or clothing. Take off all contaminated clothing and wash it before reuse. Contaminated work clothing should not be allowed out of the workplace. Keep away from food, drink and animal feeding stuffs. When using do not eat, drink or smoke. Regular cleaning of equipment, work area and clothing is recommended.

Environmental exposure controls
- Do not allow into any sewer, on the ground or into any body of water.

9. PHYSICAL AND CHEMICAL PROPERTIES

**Information on basic physical and chemical properties**

Physical state
- powder
Product Code(s)  TNT843A  
Issue Date  19-May-2016  
Version  4  

Product Name  Phosphorus LR TNT Reagent A  
Revision Date  10-Aug-2016  
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Gas Under Pressure  Not classified according to GHS criteria  
Appearance  powder  
Odor  None  
Color  white  
Odor threshold  No data available  

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Remarks • Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Molecular weight</td>
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<td></td>
</tr>
<tr>
<td>pH</td>
<td>No data available</td>
<td></td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>No data available</td>
<td></td>
</tr>
<tr>
<td>Boiling point / boiling range</td>
<td>No data available</td>
<td></td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>Not applicable</td>
<td></td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>Not applicable</td>
<td></td>
</tr>
<tr>
<td>Vapor density (air = 1)</td>
<td>Not applicable</td>
<td></td>
</tr>
<tr>
<td>Specific gravity (water = 1 / air = 1)</td>
<td>&gt; 2</td>
<td></td>
</tr>
<tr>
<td>Partition Coefficient (n-octanol/water)</td>
<td>No data available</td>
<td></td>
</tr>
<tr>
<td>Soil Organic Carbon-Water Partition Coefficient</td>
<td>No data available</td>
<td></td>
</tr>
<tr>
<td>Autoignition temperature</td>
<td>No data available</td>
<td></td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>No data available</td>
<td></td>
</tr>
<tr>
<td>Dynamic viscosity</td>
<td>Not applicable</td>
<td></td>
</tr>
<tr>
<td>Kinematic viscosity</td>
<td>Not applicable</td>
<td></td>
</tr>
</tbody>
</table>

Solubility(ies) 

Water solubility 

<table>
<thead>
<tr>
<th>Water solubility classification</th>
<th>Water solubility</th>
<th>Water Solubility Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soluble</td>
<td>&gt; 1000 mg/L</td>
<td>25 °C / 77 °F</td>
</tr>
</tbody>
</table>

Solubility in other solvents 

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Solubility classification</th>
<th>Solubility</th>
<th>Solubility Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>None reported</td>
<td>No information available</td>
<td>No data available</td>
<td>No information available</td>
</tr>
</tbody>
</table>

Other Information 

Metal Corrosivity  
Not classified as corrosive to metal according to GHS criteria  

Steel Corrosion Rate  
Not applicable  

Aluminum Corrosion Rate  
Not applicable  

Volatile Organic Compounds (VOC) Content  
Not applicable.  

Bulk density  
No data available
Explosive properties
Not classified according to GHS criteria.

Explosion data
Contains oxidizer. Contact with combustible materials may cause a fire. During a fire, corrosive and toxic gases may be generated by thermal decomposition.

Upper explosion limit
No data available

Lower explosion limit
No data available

Flammable properties
Material is not classified as flammable according to GHS criteria.

Flammability Limit in Air

Upper flammability limit:
No data available

Lower flammability limit:
No data available

Flash point
Not applicable

Oxidizing properties
Not classified according to GHS criteria.

Reactivity properties
Not classified as self-reactive, pyrophoric, self-heating or emitting flammable gases in contact with water according to GHS criteria.

10. STABILITY AND REACTIVITY

Reactivity properties
Not classified as self-reactive, pyrophoric, self-heating or emitting flammable gases in contact with water according to GHS criteria

Chemical stability
Stable under recommended storage conditions.

Special dangers of the product
No information available

Possibility of Hazardous Reactions
No information available.

Hazardous polymerization
Hazardous polymerization does not occur.

Conditions to avoid
Exposure to air. Heating to decomposition. Excess moisture.

Incompatible materials
Aluminum. Reducing agent.

Hazardous Decomposition Products
Sulfur oxides, sodium oxides. Thermal decomposition can lead to release of irritating and toxic gases and vapors.

Explosive properties
Not classified according to GHS criteria. Contains oxidizer. Contact with combustible materials may cause a fire. During a fire, corrosive and toxic gases may be generated by thermal decomposition.
11. TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure

**Product Information**
Respiratory sensitizer. May cause respiratory irritation. Causes skin irritation. Causes eye irritation. Harmful if swallowed.

**Inhalation**
May cause sensitization by inhalation. Avoid breathing dust/fume/gas/mist/vapors/spray.

**Eye contact**
Contact with eyes may cause irritation.

**Skin contact**
Causes skin irritation.

**Ingestion**
Harmful if swallowed.

**Aggravated Medical Conditions**
Pre-existing: Eye disorders. Skin disorders. Respiratory disorders.

**Toxicologically synergistic products**
None known.

**Toxicokinetics, metabolism and distribution**
See ingredients information below.

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Toxicokinetics, metabolism and distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boric acid (HBO2), sodium salt, tetrahydrate (10-30) CAS#: 10555-76-7</td>
<td>Boric acid, sodium salt and borates are not metabolized, neither do they accumulate in the body except for low deposit in bone. No organic boron compounds have been reported as metabolites.</td>
</tr>
</tbody>
</table>

Product Acute Toxicity Data

**Oral Exposure Route**
No data available

**Dermal Exposure Route**
No data available

**Inhalation (Dust/Mist) Exposure Route**
No data available

**Inhalation (Vapor) Exposure Route**
No data available

**Inhalation (Gas) Exposure Route**
No data available

The following values are calculated based on chapter 3.1 of the GHS document

**ATEmix (oral)** 993.00 mg/kg

Ingredient Acute Toxicity Data

**Oral Exposure Route**

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Endpoint type</th>
<th>Reported dose</th>
<th>Exposure time</th>
<th>Toxicological effects</th>
<th>Key literature references and sources for data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boric acid (HBO2), sodium salt,</td>
<td>Rat LD&lt;sub&gt;100&lt;/sub&gt;</td>
<td>2330 mg/kg</td>
<td>None reported</td>
<td>None reported</td>
<td>HSDB (Hazardous Substances Data Bank)</td>
</tr>
</tbody>
</table>
Dermal Exposure Route
No data available

Inhalation (Dust/Mist) Exposure Route
No data available

Inhalation (Vapor) Exposure Route
No data available

Inhalation (Gas) Exposure Route
No data available

Product Corrosion/Irritation Data
No data available.

Ingredient Corrosion/Irritation Data

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Test method</th>
<th>Species</th>
<th>Reported dose</th>
<th>Exposure time</th>
<th>Results</th>
<th>Key literature references and sources for data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium persulfate (50 - 100) CAS#: 7775-27-1</td>
<td>United States Department of Transportation (DOT) Skin Corrosion Test</td>
<td>Rabbit</td>
<td>None reported</td>
<td>None reported</td>
<td>Skin irritant</td>
<td>ECHA (The European Chemicals Agency)</td>
</tr>
</tbody>
</table>

Product Serious Eye Damage/Eye Irritation Data
No data available.

Ingredient Eye Damage/Eye Irritation Data

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Test method</th>
<th>Species</th>
<th>Reported dose</th>
<th>Exposure time</th>
<th>Results</th>
<th>Key literature references and sources for data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium persulfate (50 - 100) CAS#: 7775-27-1</td>
<td>Organization for Economic Co-operation and Development (OECD) - Test 405: Acute Eye Corrosion/Irritation</td>
<td>Rabbit</td>
<td>None reported</td>
<td>None reported</td>
<td>Eye irritant</td>
<td>ECHA (The European Chemicals Agency)</td>
</tr>
</tbody>
</table>

Sensitization Information

Product Sensitization Data

Skin Sensitization Exposure Route
No data available.

Respiratory Sensitization Exposure Route
No data available.

Ingredient Sensitization Data

Skin Sensitization Exposure Route
No data available.
Respiratory Sensitization Exposure Route
No data available.

Chronic Toxicity Information

Product Repeat Dose Toxicity Data

Oral Exposure Route
No data available.

Dermal Exposure Route
No data available.

Inhalation (Dust/Mist) Exposure Route
No data available.

Inhalation (Vapor) Exposure Route
No data available.

Inhalation (Gas) Exposure Route
No data available.

Ingredient Repeat Dose Toxicity Data

Oral Exposure Route
No data available

Dermal Exposure Route
No data available

Inhalation (Dust/Mist) Exposure Route
No data available

Inhalation (Vapor) Exposure Route
No data available

Inhalation (Gas) Exposure Route
No data available

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS No</th>
<th>ACGIH</th>
<th>IARC</th>
<th>NTP</th>
<th>OSHA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium persulfate</td>
<td>7775-27-1</td>
<td>-</td>
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<td>Boric acid (HBO2), sodium salt, tetrahydrate</td>
<td>10555-76-7</td>
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<td>Lithium sulfate monohydrate</td>
<td>10102-25-7</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Legend

- **ACGIH (American Conference of Governmental Industrial Hygienists)**
  Does not apply

- **IARC (International Agency for Research on Cancer)**
  Does not apply

- **NTP (National Toxicology Program)**
  Does not apply

- **OSHA (Occupational Safety and Health Administration of the US Department of Labor)**
  X - Present

Product Carcinogenicity Data
No data available

Oral Exposure Route
No data available

Dermal Exposure Route
No data available

Inhalation (Dust/Mist) Exposure Route
No data available

Inhalation (Vapor) Exposure Route
No data available

Inhalation (Gas) Exposure Route
No data available

Ingredient Carcinogenicity Data

Oral Exposure Route
No data available

Dermal Exposure Route
No data available
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route

Product Germ Cell Mutagenicity \textit{in vitro} Data
No data available.

Ingredient Germ Cell Mutagenicity \textit{in vitro} Data
No data available.

Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route

Ingredient Germ Cell Mutagenicity \textit{in vivo} Data
Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route

Ingredient Reproductive Toxicity Data
Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route

12. ECOLOGICAL INFORMATION

Ecotoxicity
Harmful to aquatic life.
Product Code(s) TNT843A
Issue Date 19-May-2016
Version 4

Product Name Phosphorus LR TNT Reagent A
Revision Date 10-Aug-2016
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Product Ecological Data

Aquatic toxicity

Fish  No data available
Crustacea No data available
Algae No data available

Terrestrial toxicity

Soil No data available
Vertebrates No data available
Invertebrates No data available

Ingredient Ecological Data

Aquatic toxicity

Fish

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Exposure time</th>
<th>Species</th>
<th>Endpoint type</th>
<th>Reported dose</th>
<th>Key literature references and sources for data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium persulfate</td>
<td>96 hours</td>
<td>Oncorhynchus mykiss</td>
<td>LC₅₀</td>
<td>76 mg/L</td>
<td>ECHA (The European Chemicals Agency)</td>
</tr>
<tr>
<td>(50 - 100) CAS#: 7775-27-1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crustacea

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Exposure time</th>
<th>Species</th>
<th>Endpoint type</th>
<th>Reported dose</th>
<th>Key literature references and sources for data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium persulfate</td>
<td>48 Hours</td>
<td>Daphnia magna</td>
<td>EC₅₀</td>
<td>120 mg/L</td>
<td>ECHA (The European Chemicals Agency)</td>
</tr>
<tr>
<td>(50 - 100) CAS#: 7775-27-1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Chemical Name

<table>
<thead>
<tr>
<th>Exposure time</th>
<th>Species</th>
<th>Endpoint type</th>
<th>Reported dose</th>
<th>Key literature references and sources for data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lithium sulfate monohydrate</td>
<td>24 hours</td>
<td>Daphnia magna</td>
<td>EC₅₀</td>
<td>196.79 mg/L</td>
</tr>
<tr>
<td>(5 - 10) CAS#: 10102-25-7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Algae No data available

Terrestrial toxicity

Soil No data available
Vertebrates No data available
Invertebrates No data available

Other Information

Canadian Environmental Protection Act (CEPA) - Domestic Substances List (DSL):
Environmentally Hazardous Substances Categorizations

Persistence and degradability
No information available.
Product Code(s)  TNT843A
issue Date  19-May-2016
Version  4

Product Biodegradability Data
No data available.

Ingredient Biodegradability Data
No data available

Bioaccumulation
No information available.

Product Bioaccumulation Data
No data available.

Ingredient Bioaccumulation Data
No data available

Additional Information

Product Information
No data available

Partition Coefficient (n-octanol/water)
No data available

Ingredient Information

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Partition Coefficient (n-octanol/water)</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium persulfate (50 - 100) CAS#: 7775-27-1</td>
<td>log $K_{ow}$ = -3.02</td>
<td>No information available</td>
</tr>
<tr>
<td>Boric acid (HBO2), sodium salt, tetrahydrate (10 - 30) CAS#: 10555-76-7</td>
<td>log $K_{ow}$ = -3.73</td>
<td>Estimation through KOWWIN v1.68 part of the Estimation Programs Interface (EPI) Suite™</td>
</tr>
</tbody>
</table>

Mobility
No information available.

Product Information
No data available

Soil Organic Carbon-Water Partition Coefficient
No data available

Ingredient Information
No data available

Additional Information

Water solubility

Product Information

<table>
<thead>
<tr>
<th>Water solubility classification</th>
<th>Water solubility</th>
<th>Water Solubility Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soluble</td>
<td>&gt; 1000 mg/L</td>
<td>25 °C / 77 °F</td>
</tr>
</tbody>
</table>

Ingredient Information

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Water solubility classification</th>
<th>Water solubility</th>
<th>Water solubility temperature °C</th>
<th>Water solubility temperature °F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium persulfate (50 - 100) CAS#: 7775-27-1</td>
<td>Completely soluble</td>
<td>549000 mg/L</td>
<td>20 °C</td>
<td>68 °F</td>
</tr>
<tr>
<td>Boric acid (HBO2), sodium salt, tetrahydrate</td>
<td>Completely soluble</td>
<td>20000 mg/L</td>
<td>20 °C</td>
<td>68 °F</td>
</tr>
</tbody>
</table>
13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Disposal of wastes
Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated packaging
Dispose of in accordance with federal, state and local regulations.

US EPA Waste Number
Not applicable

14. TRANSPORT INFORMATION

DOT
UN/ID no 3316
Proper shipping name Chemical kits
Hazard Class 9
Packing Group II

TDG
UN/ID no 3316
Proper shipping name Chemical kits
Hazard Class 9
Packing Group II

IATA
UN/ID no 3316
Proper shipping name Chemical kits
Hazard Class 9
Packing Group II

IMDG
UN/ID no 3316
Proper shipping name Chemical kits
Hazard Class 9
Packing Group II

Additional information
There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods. If the item is not in a reagent set or kit, the classification given above applies. If the item is part of a reagent set or kit the classification would change to the following: UN3316 Chemical Kit, Hazard Class 9, Packing Group II or III. If the item is not regulated, the Chemical Kit classification does not apply.

15. REGULATORY INFORMATION

National Inventories
Product Code(s)  TNT843A  Product Name  Phosphorus LR TNT Reagent A
Issue Date  19-May-2016  Revision Date  10-Aug-2016
Version  4  Page  15 / 17

TSCA  Complies
DSL/NDSL  Complies

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

International Inventories
EINECS/ELINCS  Complies
ENCS  Complies
IECSC  Complies
KECL  Complies
PICCS  Complies
TCSI  Complies
AICS  Complies
NZIoC  Complies

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
ENCS - Japan Existing and New Chemical Substances
IECSC - China Inventory of Existing Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
TCSI - Taiwan Chemical Substances Inventory
AICS - Australian Inventory of Chemical Substances
NZIoC - New Zealand Inventory of Chemicals

US Federal Regulations

SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

SARA 311/312 Hazard Categories
- Acute health hazard  Yes
- Chronic Health Hazard  Yes
- Fire hazard  No
- Sudden release of pressure hazard  No
- Reactive Hazard  No

CWA (Clean Water Act)
This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

CERCLA
This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

US State Regulations

California Proposition 65
This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know Regulations
<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>New Jersey</th>
<th>Massachusetts</th>
<th>Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium persulfate 7775-27-1</td>
<td>X</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Boric acid (HBO2), sodium salt, tetrahydrate 10555-76-7</td>
<td>X</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

U.S. EPA Label Information
EPA Pesticide Registration Number  Not applicable

16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION

NFPA and HMIS Classifications

<table>
<thead>
<tr>
<th>NFPA</th>
<th>Health hazards - 2</th>
<th>Flammability - 0</th>
<th>Instability - 2</th>
<th>Physical and Chemical Properties -</th>
</tr>
</thead>
<tbody>
<tr>
<td>HMIS</td>
<td>Health hazards - 2*</td>
<td>Flammability - 0</td>
<td>Physical hazards - 2</td>
<td>Personal protection - X</td>
</tr>
</tbody>
</table>

- See section 8 for more information

Key or legend to abbreviations and acronyms used in the safety data sheet

NIOSH IDLH  Immediately Dangerous to Life or Health
ACGIH  ACGIH (American Conference of Governmental Industrial Hygienists)
NDF  no data

Legend - Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

TWA  TWA (time-weighted average)
MAC  Maximum Allowable Concentration
X  Listed

STEL  Short Term Exposure Limit
Ceiling  Ceiling Limit Value
Vacated  These values have no official status. The only binding levels of contaminants are those listed in the final OSHA PEL. These lists are for reference purposes only. Please note that some reference state regulations of these "liberated" exposure limits in their state regulations.

SKN*  Skin designation
RSP+  Respiratory sensitization
C  Carcinogen
M  mutagen
SKN+  Skin sensitization
**  Hazard Designation
R  Reproductive toxicant

Prepared By  Hach Product Compliance Department
Issue Date  19-May-2016
Revision Date  10-Aug-2016
Revision Note  None

Disclaimer

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.
THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

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End of Safety Data Sheet