MSDS: Total Glutathione Assay kit  
Product No. GT 20

This product, GT 20 – Total Glutathione Assay kit, is provided and produced by Oxford Biomedical Research as an in vitro diagnostic test kit for the sole purpose of research use.

Manufacturer:  
Oxford Biomedical Research  
2165 Avon Industrial Dr.  
Rochester Hills, MI 48309  
(248) 852-8815

Chemical Identification:

**Glutathione Oxidoreductase**  
Chemical Name: Glutathione Oxidoreductase  
Cas No.: 9001-48-3  
Physical Appearance: Solid/ yellow powder

**Metaphosphoric Acid**  
Common Name: MPA  
Chemical Name: Metaphosphoric Acid  
Chemical Formula: \((\text{HPO}_3)_n\)  
Cas No.: 372667-86-0  
Physical Appearance: Clear liquid

**β-NADPH**  
Common Name: β-NADPH₂, β-Nicotinamide Adenine Dinucleotide Phosphate (reduced)  
Chemical Name: β-NADPH₂, β-Nicotinamide Adenine Dinucleotide Phosphate (reduced)  
Chemical Formula: \(\text{C}_{21}\text{H}_{30}\text{N}_{7}\text{O}_{17}\text{P}_3\)  
Cas No.: 2646-71-1  
Physical Appearance: Solid/ whitepowder

**DTNB**  
Common Name: DTNB  
Chemical Name: 5,5’-Dithiobis(2-nitrobenzoic acid)  
Chemical Formula: \(\text{C}_{13}\text{H}_{9}\text{N}_{2}\text{O}_{5}\text{S}_2\)  
Cas No.: 69-78-3  
Physical Appearance: Solid/ yellow powder
Hazardous Identification:

**Glutathione Oxidoreductase**
Emergency Overview: Irritant
Target Organs: Eyes, respiratory system and skin.

**Metaphosphoric Acid**
Emergency Overview: Corrosive
Target Organs: Non-discriminatory upon contact

**β-NADPH$_2$**
Emergency Overview: Irritant
Target Organs: Eyes, respiratory system and skin.

**DTNB**
Emergency Overview: Irritant
Target Organs: N/A

First Aid Measures:

**Glutathione Oxidoreductase**
Oral Exposure: Wash out mouth with water provided the person is conscious – contact a physician.
Inhalation Exposure: Remove to fresh air. If not breathing give artificial respiration. Give oxygen if breathing is difficult. Contact a physician.
Dermal Exposure: Immediately wash with soap and water.
Eye Exposure: Flush with water for minimum of 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Contact a physician.

**Metaphosphoric Acid**
Oral Exposure: Wash out mouth with water if person is conscious. Do not induce vomiting. Contact a physician.
Inhalation Exposure: Remove to fresh air. If not breathing give artificial respiration. Give oxygen if breathing is difficult. Contact a physician.
Dermal Exposure: Remove contaminated clothing and flush affected areas with water for 15 minutes. Contact a physician.
Eye Exposure: Flush with water for minimum of 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Contact a physician.

**β-NADPH$_2$**
Oral Exposure: Wash out mouth with water provided the person is conscious – contact a physician.
Inhalation Exposure: Remove to fresh air. If not breathing give artificial
respiration. Give oxygen if breathing is difficult. Contact a physician.

Dermal Exposure: Immediately wash with soap and water.
Eye Exposure: Flush with water for minimum of 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Contact a physician.

**DTNB**

Oral Exposure: Wash out mouth with water provided the person is conscious – contact a physician.

Inhalation Exposure: Remove to fresh air If not breathing give artificial respiration. Give oxygen if breathing is difficult. Contact a physician.

Dermal Exposure: Immediately wash with soap and water.
Eye Exposure: Flush with water for minimum of 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Contact a physician.

**Fire Fighting Measures:**

**Glutathione Oxidoreductase**

Autoignition Temp: N/A
Extinguishable Media: Use media appropriate for surrounding conditions
Firefighting: Wear self-contained breathing apparatus and protective clothing and equipment

**Metaphosphoric Acid**

Autoignition Temp: N/A
Extinguishable Media: Carbon dioxide, dry chemical powder or appropriate foam.
Firefighting: Wear self-contained breathing apparatus and protective clothing and equipment
Emits toxic fumes under fire conditions

**β-NADPH₂**

Autoignition Temp: N/A
Extinguishable Media: Water spray, carbon dioxide, dry chemical powder or appropriate foam.
Firefighting: Wear self-contained breathing apparatus and protective clothing and equipment
Emits toxic fumes under fire conditions

**DTNB**

Autoignition Temp: N/A
Extinguishable Media: Water spray, carbon dioxide, dry chemical powder or appropriate foam.
Firefighting: Wear self-contained breathing apparatus and protective clothing and equipment
Emits toxic fumes under fire conditions
Accidental Release Measures:

**Glutathione Oxidoreductase**
- **Personal Precautions:** Wear self-contained breathing apparatus, rubber boots and heavy rubber gloves.
- **Clean Up:** Sweep up, place in a plastic bag and hold for waste disposal. Avoid the promotion of dust. Ventilate the area and wash spill site after material has been removed.

**Metaphosphoric Acid**
- **Leak or Spill:** Evacuate the area
- **Personal Precautions:** Wear self-contained breathing apparatus, rubber boots and heavy rubber gloves.
- **Clean Up:** Soak up material with paper towel and place in a bag for waste disposal. Ventilate area and wash spill site after material has been removed.

**β-NADPH$_2$**
- **Personal Precautions:** Wear self-contained breathing apparatus, rubber boots and heavy rubber gloves.
- **Clean Up:** Sweep up, place in a plastic bag and hold for waste disposal. Avoid the promotion of dust. Ventilate the area and wash spill site after material has been removed.

**DTNB**
- **Personal Precautions:** Wear self-contained breathing apparatus, rubber boots and heavy rubber gloves.
- **Clean Up:** Sweep up, place in a plastic bag and hold for waste disposal. Avoid the promotion of dust. Ventilate the area and wash spill site after material has been removed.

Handling and Storage:

**Glutathione Oxidoreductase**
- **User Exposure:** Avoid contact with eyes, skin and clothing. Avoid inhalation. Avoid prolonged or repeated exposure.
- **Storage:** Keep container closed. Store away from heat.

**Metaphosphoric Acid**
- **User Exposure:** Avoid contact with eyes, skin and clothing. Avoid inhalation. Avoid prolonged or repeated exposure.
- **Storage:** Keep container closed. Store away from heat.

**β-NADPH$_2$**
- **User Exposure:** Avoid contact with eyes, skin and clothing. Avoid inhalation. Avoid prolonged or repeated exposure.
- **Storage:** Keep container closed. Store in a cool dry place.

**DTNB**
- **User Exposure:** Avoid contact with eyes, skin and clothing. Avoid inhalation. Avoid prolonged or repeated exposure.
- **Storage:** Keep container closed. Store away from heat.
Stability and Reactivity:

**Glutathione Oxidoreductase**
- **Stability:** Stable
- **Materials to Avoid:** Strong oxidizing agents
- **Hazardous Decomposition Products:** Not known
- **Hazardous Polymerization:** Will not occur

**Metaphosphoric Acid**
- **Conditions to Avoid:** Sensitive to moisture
- **Materials to Avoid:** Strong bases, metals, nitromethane.
- **Hazardous Decomposition Products:** Thermal decomposition may produce toxic fumes of phosphorus oxides and/or phosphine
- **Hazardous Polymerization:** Will not occur

**β-NADPH**
- **Stability:** Stable
- **Materials to Avoid:** Strong oxidizing agents
- **Hazardous Decomposition Products:** Carbon monoxide, carbon dioxide, nitrogen oxides, phosphorus oxides.
- **Hazardous Polymerization:** Will not occur

**DTNB**
- **Stability:** Stable
- **Materials to Avoid:** Strong oxidizing agents, strong bases
- **Hazardous Decomposition Products:** Carbon monoxide, carbon dioxide, nitrogen oxides, sulfur oxides.
- **Hazardous Polymerization:** Will not occur

Toxicological Information:

**Glutathione Oxidoreductase**
- **Exposure:**
  - **Skin:** Irritation/ harmful if absorbed
  - **Eye:** Irritation
  - **Inhalation:** May be harmful if inhaled. May irritate mucous membranes and respiratory tract.
  - **Ingestion:** May be harmful if swallowed
  - **Sensitization:** Prolonged or repeated exposure can cause allergic reactions.
- **Symptoms of Exposure:** Not thoroughly investigated

**Metaphosphoric Acid**
- **Exposure:**
  - **Skin:** Causes burns, May be harmful if absorbed through the skin
  - **Eye:** Causes burns
  - **Inhalation:** Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract. May be harmful if swallowed
  - **Ingestion:** Burning, coughing, wheezing, shortness of breath, headache, nausea, spasm, inflammation, edema, chemical pneumonitis upon inhalation may result. Burning sensation of the dermis. Not thoroughly
The information provided in this document is believed to be correct, but does not purport to be all-inclusive. This document is to serve only as a guide. Oxford Biomedical Research shall not be held liable for damages resulting from handling or contact with the above product(s). The contents of this document are not reflective of nor a substitute for state, municipal or insurance requirements and constitute no warranty of any kind.

<table>
<thead>
<tr>
<th>Compound</th>
<th>Exposure</th>
<th>Skin</th>
<th>Eye</th>
<th>Inhalation</th>
<th>Ingestion</th>
<th>Sensitization</th>
<th>Target Organs</th>
<th>Symptoms of Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>β-NADPH₂</td>
<td>Exposure:</td>
<td>Irritation. May be harmful if absorbed.</td>
<td>Irritation</td>
<td>Irritating to the respiratory tract.</td>
<td>May be harmful if swallowed.</td>
<td>Not thoroughly investigated.</td>
<td>Nerves, liver, heart</td>
<td>CNS depression, GI disturbances, narcotic effect, convulsions</td>
</tr>
<tr>
<td>DTNB</td>
<td>Exposure:</td>
<td>Irritation. May be harmful if absorbed.</td>
<td>Irritation</td>
<td>Irritating to the respiratory tract.</td>
<td>May be harmful if swallowed.</td>
<td>Not thoroughly investigated.</td>
<td>Not thoroughly investigated</td>
<td>2080 mg/Kg mouse</td>
</tr>
</tbody>
</table>