1. PRODUCT IDENTIFICATION

SYNONYMS: SODIUM PYROSULFITE; PYROSULFUROUS ACID, DISODIUM SALT
CAS NO: 7681-57-4 SODIUM METABISULFITE; 7631-90-5 SODIUM BISULFITE.

MOLECULAR WEIGHT: 190.13
CHEMICAL FORMULA: NA2S2O5 (SODIUM METABISULFITE) AND NAHSO3 (SODIUM BISULFITE)

2. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>INGREDIENT</th>
<th>CAS NO</th>
<th>PERCENT</th>
<th>HAZARDOUS</th>
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<tbody>
<tr>
<td>SODIUM METABISULFITE</td>
<td>7681-57-4</td>
<td>100%</td>
<td>YES</td>
</tr>
<tr>
<td>SODIUM BISULFITE</td>
<td>7631-90-5</td>
<td>&lt; 0.001%</td>
<td>NO</td>
</tr>
</tbody>
</table>

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

WARNING! HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. MAY CAUSE ALLERGIC RESPIRATORY REACTION. REACTS WITH ACIDS AND WATER RELEASING TOXIC SULFUR DIOXIDE GAS.

POTENTIAL HEALTH EFFECTS

INHALATION:
CAUSES IRRITATION TO THE RESPIRATORY TRACT. SYMPTOMS MAY INCLUDE COUGHING, SHORTNESS OF BREATH, MAY CAUSE ALLERGIC REACTION IN SENSITIVE INDIVIDUALS.
INGESTION:
MAY CAUSE GASTRIC IRRITATION BY THE LIBERATION OF SULFUROUS ACID. AN
ASTHMATIC REACTION MAY OCCUR AFTER INGESTION. LARGE DOSES MAY RESULT IN
NAUSEA, VOMITING, DIARRHEA, ABDOMINAL PAINS, CIRCULATORY DISTURBANCE, AND
CENTRAL NERVOUS SYSTEM DEPRESSION. ESTIMATED FATAL DOSE IS 10 GM.

SKIN CONTACT:
CAUSES IRRITATION TO SKIN. SYMPTOMS INCLUDE REDNESS, ITCHING, AND PAIN.

EYE CONTACT:
CAUSES IRRITATION, REDNESS, AND PAIN. CONTACT MAY CAUSE IRREVERSIBLE EYE
DAMAGE. SYMPTOMS MAY INCLUDE STINGING, TEARING, REDNESS, SWELLING, CORNEAL
DAMAGE AND BLINDNESS.

CHRONIC EXPOSURE:
NO INFORMATION FOUND.

AGGRAVATION OF PRE-EXISTING CONDITIONS:
SOME INDIVIDUALS ARE SAID TO BE DANGEROUSLY SENSITIVE TO MINUTE AMOUNTS OF
SULFITES IN FOODS. SYMPTOMS MAY INCLUDE BRONCHO CONSTRICITION, SHOCK,
GASTROINTESTINAL DISTURBANCES, ANGIO EDEMA, FLUSHING, AND TINGLING
SENSATIONS. ONCE ALLERGY DEVELOPS, FUTURE EXPOSURES CAN CAUSE ASTHMA
ATTACKS WITH SHORTNESS OF BREATH, WHEEZING, AND COUGH.

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4. FIRST AID MEASURES

INHALATION:
REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF
BREATHING IS DIFFICULT, GIVE OXYGEN. GET MEDICAL ATTENTION.

INGESTION:
INDUCE VOMITING IMMEDIATELY AS DIRECTED BY MEDICAL PERSONNEL. NEVER GIVE
ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. GET MEDICAL ATTENTION.

SKIN CONTACT:
WIPE OFF EXCESS MATERIAL FROM SKIN THEN IMMEDIATELY FLUSH SKIN WITH PLENTY
OF WATER FOR AT LEAST 15 MINUTES. REMOVE CONTAMINATED CLOTHING AND SHOES.
GET MEDICAL ATTENTION. WASH CLOTHING BEFORE REUSE. THOROUGHLY CLEAN SHOES
BEFORE REUSE.

EYE CONTACT:
IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES,
LIFTING LOWER AND UPPER EYELIDS OCCASIONALLY. GET MEDICAL ATTENTION
IMMEDIATELY.

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5. FIRE FIGHTING MEASURES

FIRE:
NOT CONSIDERED TO BE A FIRE HAZARD.

EXPlosion:
NOT CONSIDERED TO BE AN EXPLOSION HAZARD.

FIRE EXTINGUISHING MEDIA:
USE ANY MEANS SUITABLE FOR EXTINGUISHING SURROUNDING FIRE. DO NOT ALLOW
WATER RUNOFF TO ENTER SEWERS OR WATERWAYS.

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.

6. ACCIDENTAL RELEASE MEASURES

VENTILATE AREA OF LEAK OR SPILL. WEAR APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT AS SPECIFIED IN SECTION 8. SPILLS: PICK UP AND PLACE IN A SUITABLE CONTAINER FOR RECLAMATION OR DISPOSAL, USING A METHOD THAT DOES NOT GENERATE DUST. CAUTIOUSLY SPRAY RESIDUE WITH PLENTY OF WATER, PROVIDING VENTILATION TO CLEAR SULFUR DIOXIDE FUMES GENERATED FROM WATER CONTACT. 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

KEEP IN A TIGHTLY CLOSED CONTAINER. PROTECT FROM PHYSICAL DAMAGE. STORE IN A COOL, DRY, VENTILATED AREA AWAY FROM SOURCES OF HEAT, MOISTURE AND INCOMPATIBILITIES. RELEASES TOXIC SULFUR DIOXIDE GAS WHEN IN CONTACT WITH WATER, ICE. KEEP AWAY FROM ACIDS, WATER, ICE, AND OXIDIZING AGENTS. USE ONLY WITH APPROPRIATE PROTECTIVE EQUIPMENT. DO NOT USE IN UNVENTILATED AREAS SUCH AS HULLS OF FISHING BOATS, WALK IN COOLERS OR CONFINED SPACES. CONTAINERS OF THIS MATERIAL MAY BE HAZARDOUS WHEN EMPTY SINCE THEY RETAIN PRODUCT RESIDUES (DUST, SOLIDS); OBSERVE ALL WARNINGS AND PRECAUTIONS LISTED FOR THE PRODUCT.

8. EXPOSURE CONTROLS/PERSOAL PROTECTION

AIRBORNE EXPOSURE LIMITS:
- ACGIH THRESHOLD LIMIT VALUE (TLV):
5MG/M3 (TWA) FOR SODIUM BISULFITE & FOR SODIUM METABISULFITE, A4 NOT CLASSIFIABLE AS A HUMAN CARCINOGEN.

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, A HALF-FACE RESPIRATOR WITH AN ACID GAS CARTRIDGE MAY BE WORN FOR UP TO TEN TIMES THE EXPOSURE LIMIT OR THE MAXIMUM USE CONCENTRATION SPECIFIED BY THE APPROPRIATE REGULATORY AGENCY OR RESPIRATOR SUPPLIER, WHICHER IS LOWEST. A FULL-FACE PIECE RESPIRATOR WITH AN ACID GAS CARTRIDGE MAY BE WORN UP TO 50 TIMES THE EXPOSURE LIMIT, OR THE MAXIMUM USE CONCENTRATION SPECIFIED BY THE APPROPRIATE REGULATORY AGENCY, OR RESPIRATOR SUPPLIER, WHICHER IS LOWEST. FOR EMERGENCIES OR INSTANCES WHERE THE EXPOSURE LEVELS ARE NOT KNOWN, USE A FULL-FACEPIECE
POSITIVE-PRESSURE, AIR-SUPPLIED RESPIRATOR. WARNING: AIR-PURIFYING
RESPIRATORS DO NOT PROTECT WORKERS IN OXYGEN-DEFICIENT ATMOSPHERES.

SKIN PROTECTION:
WEAR IMPERVIOUS PROTECTIVE CLOTHING, INCLUDING BOOTS, GLOVES, LAB COAT,
APRON OR COVERALLS, AS APPROPRIATE, TO PREVENT SKIN CONTACT. (NEOPRENE,
POLYVINYL CHLORIDE).

EYE PROTECTION:
USE CHEMICAL SAFETY GOGGLES AND/OR FULL FACE SHIELD WHERE DUSTING OR
SPLASHING OF SOLUTIONS IS POSSIBLE. MAINTAIN EYE WASH FOUNTAIN AND
QUICK-DRENCH FACILITIES IN WORK AREA.

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9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: WHITE TO YELLOW WHITE CRYSTALLINE
GRANULES.

BOILING POINT:
NOT APPLICABLE.

ODOR:
SLIGHT ODOR OF SULFUR DIOXIDE.

MELTING POINT:
150°C (302°F)

SOLUBILITY:
VERY SOLUBLE IN WATER, INSOLUBLE
IN ALCOHOL.

VAPOR DENSITY (AIR=1):
NO INFORMATION FOUND.

SPECIFIC GRAVITY:
1.48

VAPOR PRESSURE (MM HG):
NO INFORMATION FOUND.

PH:
ACQUEOUS SOLUTION IS ACIDIC.

EVAPORATION RATE (BUAC=1):
NO INFORMATION FOUND.

% VOLATILES BY VOLUME @ 21°C (70°F):
0

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10. STABILITY AND REACTIVITY

STABILITY:
STRENGTH DIMINISHES SOMEWHAT WITH AGE. GRADUALLY DECOMPOSES IN AIR TO
SULFATE, GENERATING SULFURIC ACID GAS. CONTACT WITH MOISTURE (WATER, WET
ICE, ETC.), WILL RELEASE TOXIC SULFUR DIOXIDE GAS.

HAZARDOUS DECOMPOSITION PRODUCTS:
OXIDES OF SULFUR AND SODIUM MAY FORM WHEN HEATED TO DECOMPOSITION.

HAZARDOUS POLYMERIZATION:
WILL NOT OCCUR.

INCOMPATIBILITIES:
WATER, ACIDS, ALKALIS, SODIUM NITRITE, OXIDIZERS, ALUMINUM POWDER.

CONDITIONS TO AVOID:
MOISTURE, HEAT, FLAMES, IGNITION SOURCES AND INCOMPATIBLES.

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11. TOXICOLOGICAL INFORMATION


---/CANCER LISTS/-----------------------------------------------

---NP T CARCINOGEN---

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<tr>
<th>INGREDIENT</th>
<th>KNOWN</th>
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<td>SODIUM BISULFITE (7631-90-5)</td>
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<td>3</td>
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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 DISPOSAL FACILITY. 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

NOT REGULATED.

15. REGULATORY INFORMATION

---/CHEMICAL INVENTORY STATUS - PART 1/-----------------------------------------------

<table>
<thead>
<tr>
<th>INGREDIENT</th>
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---/CHEMICAL INVENTORY STATUS - PART 2/-----------------------------------------------

---CANADA---

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<td>SODIUM BISULFITE (7631-90-5)</td>
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</table>
### SODIUM METABISULFITE (7681-57-4)
- **Sara 302**: No
- **Sara 313**: No

### SODIUM BISULFITE (7631-90-5)
- **Sara 302**: No
- **Sara 313**: No

### Chemical Weapons Convention
- Acute: No
- Chronic: No
- Fire: No
- Pressure: No

### Australian Hazchem Code
- No information found.

### Poison Schedule
- No information found.

### 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: 1

#### Label Hazard Warning:
危害: 有害，若吞下或吸入。可导致皮肤、眼睛和呼吸系统的刺激。可能引起过敏性呼吸反应。与酸和水接触会释放有毒硫氧化物气体。

#### Label Precautions:
- 避免接触眼睛、皮肤和衣物。
- 避免吸入粉尘。
- 保持容器封闭。
- 使用时确保良好的通风。
- 处理后彻底清洗。
- 对试剂和技术级不用于食品。对于TAC级：不得用于肉类或在已知为维生素B-1的来源为维生素B-1的动物饲料，亦不得用于水果或蔬菜。
- 提供新鲜的空气。
- 给予人工呼吸。
- 洗涤衣物和鞋子。

#### Label First Aid:
- 若吞下：立即诱导呕吐。
- 若吸入：移至新鲜空气。
- 若皮肤接触：立即用水清洗。
- 若眼睛接触：用水冲洗。
- 若接触皮肤：用水冲洗。
- 若吸入：立即停止使用。
- 若皮肤灼伤：用水冲洗。

For Additional Information:
Contact: MSDS Coordinator - Vopak USA

http://commerce.vopakusa.com/commerce/IndustrialChemical?action=DisplayProductDocum... 1/21/02
During business hours, Pacific Time - (425) 889-3400

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END OF MSDS