GENERAL STORAGE CODE GREEN

| Section 1 | Chemical Product and | Company | v Identification |
|-----------|-----------------------------|---------|------------------|
|-----------|-----------------------------|---------|------------------|

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CHEMTREC 24 Hour Emergency USA Phone Number (800) 424-9300 1 703-741-5500 (from anywhere in the world). For laboratory and industrial use only.

Not for drug, food or household use. L+ASCORBIC ACID Product Synonyms Vitamin C Section 2 **Hazards Identification** Precautionary statement(s): This substance or mixture has not been classified as hazardous according Do not breathe dust. Do not get in eyes, on skin, or on clothing. Wear protective to the Globally Harmonized System (GHS) of Classification and Labeling of gloves/protective clothing/eye protection/face protection. Wash hands thoroughly Chemicals. after handling. Get medical attention if you feel unwell. Signal word: None required Pictograms: No symbol required Target organs: None known GHS Classification: None required GHS Label information: Hazard statement: None required Precautionary statement: None required

Hazards not otherwise classified:

Health hazards not otherwise classified (HHNOC) - Combustible dust Physical hazards not otherwise classified (PHNOC) - Not Known

| Section 3 | Composition / Information on | Composition / Information on Ingredients | | | | |
|---------------|------------------------------|--|------|-----------|--|--|
| Chemical Name | | CAS # | % | EINECS | | |
| Ascorbic acid | | 50-81-7 | 100% | 200-066-2 | | |
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| | | | | | | |
| Section 4 | First Aid Measures | | | | | |

INGESTION: Call physician or Poison Control Center immediately. Induce vomiting only if advised by appropriate medical personnel. Never give anything by mouth to an unconscious person.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

EYE CONTACT: Check for and remove contact lenses. Flush thoroughly with water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get immediate medical attention.

SKIN ABSORPTION: Remove contaminated clothing. Flush thoroughly with mild soap and water. If irritation occurs, get medical attention.

Section 5 Fire Fighting Measures

Suitable Extinguishing Media: Use any media suitable for extinguishing supporting fire

Protective Actions for Fire-fighters: In fire conditions, wear a NIOSH/MSHA-approved self-contained breathing apparatus and full protective gear. Use water spray to keep fire-exposed containers cool.

Specific Hazards: During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Section 6 Accidental Release Measures

Personal Precautions: Evacuate personnel to safe area. Use proper personal protective equipment as indicated in Section 8. Provide adequate ventilation.

Environmental Precautions: Avoid runoff into storm sewers and ditches which lead to waterways.

Containment and Cleanup: Sweep or vacuum up and place in a suitable container for proper disposal. Wash spill area with soap and water.

Section 7 Handling & Storage

Precautions for Safe Handling: Read label on container before using. Do not wear contact lenses when working with chemicals. Keep out of reach of children. Avoid contact with eyes, skin and clothing. Do not inhale dusts. Use with adequate ventilation. Avoid ingestion. Wash thoroughly after handling. Remove and wash clothing before reuse

Conditions for Safe Storage: Store in a cool, dry, well-ventilated area away from incompatible substances. Protect from light, air and moisture.

| Section 8 | Exposure Controls / Personal Protection | | | | |
|------------------|---|------------------|------------------|------------------|--|
| Exposure Limits: | Chemical Name | ACGIH (TLV) | OSHA (PEL) | NIOSH (REL) | |
| Exposure Linits. | Ascorbic acid | None established | None established | None established | |

Engineering controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower and fire extinguishing material. Personnel should wear safety glasses, goggles, or faceshield, lab coat or apron, appropriate protective gloves. Use adequate ventilation to keep airborne concentrations low.

Respiratory protection: None should be needed in normal laboratory handling at room temperatures. If dusty conditions prevail, work in fume hood or wear a NIOSH/MSHAapproved respirator.

| Section 9 Physical & Chemical Prop | perties | |
|---|--|---|
| Appearance: Solid, white, crystalline powder. Odor: Nearly odorless. Odor threshold: Data not available. pH: Data not available. Melting / Freezing point: 190-192°C (374-377°F) Boiling point: Decomposes Flash point: Non flammable | Evaporation rate (=1): Data not available Flammability (solid/gas): Data not available. Explosion limits: Lower / Upper: Non flammable Vapor pressure (mm Hg): Negligible Vapor density (Air = 1): Data not available Relative density (Specific gravity): 1.65 Solubility(ies): 30% by weight at 20°C in water. | Partition coefficient: Data not available Auto-ignition temperature: $660^{\circ}C$ (1220°F) Decomposition temperature: Data not available. Viscosity: Data not available. Molecular formula: $C_6H_8O_6$ Molecular weight: 176.13 |
| Section 10 Stability & Reactivity | | |

Chemical stability: Stable

Hazardous polymerization: Will not occur.

Conditions to avoid: Excessive temperatures, moisture, air and light.

Incompatible materials: Alkalies, iron, copper, water, oxidizing agents, acids.

Hazardous decomposition products: Oxides of carbon.

Section 11 **Toxicological Information**

Acute toxicity: Data not available Skin corrosion/irritation: Data not available Serious eye damage/irritation: Data not available Respiratory or skin sensitization: Data not available Germ cell mutagenicity: Data not available Carcinogenity: Data not available NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP. IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC. OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA. Reproductive toxicity: Data not available STOT-single exposure: Data not available STOT-repeated exposure: Data not available Aspiration hazard: Data not available Potential health effects: Inhalation: Inhalation may cause cough and sore throat. Ingestion: May cause gastrointestinal irritation. Skin: May cause mild irritation with redness. Eves: May cause mild irritation with redness and pain. Signs and symptoms of exposure: See Potential health effects above. Additional information: RTECS #: CI7650000 Section 12 **Ecological Information** Toxicity to fish: No data available Toxicity to daphnia and other aquatic invertebrates: No data available Toxicity to algae: No data available Persistence and degradability: No data available Bioaccumulative potential: No data available Mobility in soil: No data available PBT and vPvB assessment: No data available Other adverse effects: An environmental hazard cannot be excluded in the event of unprofessional handling or disposal Section 13 **Disposal Considerations** These disposal guidelines are intended for the disposal of catalog-size quantities only. Federal regulations may apply to empty container. State and/or local nency.

| regulations may be different. Dispose of | in accordance with all local, state and fe | deral regulations or contract with a lice | ensed chemical disposal agenc |
|--|--|---|-------------------------------|
| Section 14 Transport Informat | ion (US DOT / CANADA TDG) | | |
| UN/NA number: Not applicable | Shipping name: Not Regulated | | |
| Hazard class: Not applicable | Packing group: Not applicable | Reportable Quantity: No | Marine pollutant: No |

| Hazard class: Not applicable | Packing group: Not applicat | ole |
|------------------------------|-----------------------------|------|
| Exceptions: Not applicable | 2016 ERG Guide # Not applic | able |

Begulatory Infor

| Section 15 | Regulatory Information | | | | | | |
|--------------------------|--|---------------|---------------------------|------------|--------|------------|---|
| A chemical is considered | to be listed if the CAS number for the a | nhydrous form | is on the Inventory list. | | | | |
| Compone | nt | TSCA | CERLCA (RQ) | RCRA code | DSL | NDSL | CA Prop 65 |
| Ascorbic acid | | Listed | Not listed | Not listed | Listed | Not listed | This product does not contain any chemicals known to the State of California to cause cancer or reproductive toxicity. |

Section 16 **Other Information**

The information contained herein is furnished without warranty of any kind. Employers should use this information only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use of these materials and the safety and health of employees. NTP: National Toxicology Program, IARC: International Agency for Research on Cancer, OSHA: Occupational Safety and Health Administration, STOT: Specific Target Organ Toxicity, SE: Single Exposure, RE: Repeated Exposure, ERG: Emergency Response Guidebook Form 06/2015

Section 1 Chemical Product and Company Identification

Benedict's Sugar Test Reagent ; Benedict's Solution ; Benedict's Qualitative Reagent

BENEDICT'S QUALITATIVE SOLUTION

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Product Synonyms

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CHEMTREC 24 Hour Emergency USA Phone Number (800) 424-9300 1 703-741-5500 (from anywhere in the world).

For laboratory and industrial use only. Not for drug, food or household use.

| Section 2 Hazards Identification | |
|--|---|
| Signal word: WARNING Pictograms: GHS07 / GHS09 Target organs: Liver, kidneys. Image: Signal word: Liver, kidneys. Image: Signal word: Sign | Precautionary statement(s): P261: Avoid breathing mist/vapours/spray. P264: Wash hands thoroughly after handling. P270: Do not eat, drink or smoke when using this product. P271: Use only outdoors or in a well-ventilated area. P273: Avoid release to the environment. P301+P330+P312: IF SWALLOWED: Rinse mouth. Call a POISON CENTER or doctor if you feel unwell. P304+P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing. P332+P313: If skin irritation occurs: Get medical attention. 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 attention. P391: Collect spillage. P501: Dispose of contents/container to a licensed chemical disposal agency in accordance with local/regional/national regulations. |

Hazards not otherwise classified:

Health hazards not otherwise classified (HHNOC) - Not Known Physical hazards not otherwise classified (PHNOC) - Not Known

| Section 3 | Section 3 Composition / Information on Ingredients | | | | | |
|--------------------------|--|-----------|-------|-----------------------|--|--|
| Chemical Name | | CAS # | % | EINECS | | |
| Water | | 7732-18-5 | 77.9% | 231-791-2 | | |
| Sodium citrate | | 68-04-2 | 13.7% | 200-675-3 | | |
| Sodium carbonate | | 497-19-8 | 6.9% | 207-838-8 | | |
| Cupric sulfate, pentahyo | drate | 7758-99-8 | 1.5% | 231-847-6 (anhydrous) | | |
| | | | | | | |
| | | | | | | |
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| | | | | | | |

Section 4 First Aid Measures

INGESTION: Call physician or Poison Control Center immediately. Induce vomiting only if advised by appropriate medical personnel. Never give anything by mouth to an unconscious person.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

EYE CONTACT: Check for and remove contact lenses. Flush thoroughly with water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get immediate medical attention.

SKIN ABSORPTION: Remove contaminated clothing. Flush thoroughly with mild soap and water. If irritation occurs, get medical attention.

Section 5 Fire Fighting Measures

Suitable Extinguishing Media: Use any media suitable for extinguishing supporting fire.

Protective Actions for Fire-fighters: In fire conditions, wear a NIOSH/MSHA-approved self-contained breathing apparatus and full protective gear. Use water spray to keep fire-exposed containers cool.

Specific Hazards: During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Section 6 Accidental Release Measures

Personal Precautions: Evacuate personnel to safe area. Use proper personal protective equipment as indicated in Section 8. Provide adequate ventilation.

Environmental Precautions: Avoid runoff into storm sewers and ditches which lead to waterways.

Containment and Cleanup: Remove all sources of ignition. Absorb with inert dry material, sweep or vacuum up and place in a suitable container for proper disposal. Wash spill area with soap and water.

Handling & Storage Section 7

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Read label on container before using. Do not wear contact lenses when working with chemicals. Keep container tightly closed. For laboratory use only. Not for drug, food or household use. Keep out of reach of children

Handling: Use with adequate ventilation. Avoid contact with eyes, skin and clothing. Avoid ingestion. Do not inhale vapors, spray or mist. Wash thoroughly after handling. Remove and wash clothing before reuse.

Storage: Store in a cool, well-ventilated area away from incompatible substances. Section 8 **Exposure Controls / Personal Protection**

| Exposure Limits: | Chemical Name | ACGIH (TLV) | OSHA (PEL) | NIOSH (REL) |
|------------------|----------------|--|-------------------|-------------------|
| Exposure Emilio. | Cupric sulfate | TWA: 0.2 mg/m ³ copper fume as Cu | None established. | None established. |
| | | | | |

Engineering controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower and fire extinguishing material. Personnel should wear safety glasses, goggles, or faceshield, lab coat or apron, appropriate protective gloves. Use adequate ventilation to keep airborne concentrations low.

Respiratory protection: None should be needed in normal laboratory handling at room temperatures. If misty conditions prevail, work in fume hood or wear a NIOSH/MSHAapproved respirator.

Physical & Chemical Properties Section 9 Appearance: Clear, pale blue liquid. Evaporation rate (= 1): < 1 Partition coefficient: (n-octanol / water): N/A Odor: No odor Flammability (solid/gas): N/A Auto-ignition temperature: N/A Odor threshold: N/A Explosion limits: Upper: N/A Lower: N/A Decomposition temperature: N/A pH: N/A Vapor pressure (mm Hg): 14 [water] Viscosity: N/A Melting / Freezing point: ~ 0°C (~ 32°F) [water] Vapor density (Air = 1): 0.7 [water] Molecular formula: Mixture. Boiling point: ~ 100°C (212°F) [water] Relative density (Specific gravity): 1.0 [water] Molecular weight: Mixture. Flash point: Not flammable. Solubility(ies): Complete. Section 10 Stability & Reactivity

Chemical stability: Stable

Hazardous polymerization: Will not occur.

Conditions to avoid: Excessive temperatures which cause evaporation.

Incompatibilities with other materials: Acids and strong oxidizers.

Hazardous decomposition products: Carbon oxides.

Section 11 **Toxicological Information**

Acute toxicity: Oral-rat LD50: 300 mg/kg (Copper sulfate) - Dermal-rat LD50: >1000 mg/kg (Copper sulfate) - Inhalation-rat LC50: 2.3 mg/l 2 hour (Sodium carbonate) Skin corrosion/irritation: Slightly irritating

Serious eye damage/irritation: Slightly irritating

Respiratory or skin sensitization: Not a sensitizer

Germ cell mutagenicity: Data not available

Carcinogenity: Data not available

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity: Data not available

STOT-single exposure: Data not available

STOT-repeated exposure: Data not available

Aspiration hazard: Data not available

Potential health effects:

Inhalation: May be harmful if inhaled. Ingestion: May be harmful if swallowed.

Skin: Contact may cause irritation.

Eyes: Contact may cause irritation.

Signs and symptoms of exposure: To the best of our knowledge the chemical, physical and toxicological properties have not been thoroughly investigated. Specific data is not available. Exercise appropriate procedures to minimize potential hazards.

Additional information: RTECS #: Not available for this mixture.

Section 12 **Ecological Information**

Toxicity to fish: Salmo gairdneri (Fish, estuary, fresh water) LC50: < .75-.84 mg/l Toxicity to daphnia and other aquatic invertebrates: No data available Toxicity to algae: No data available

Persistence and degradability: No data available

Bioaccumulative potential: No data available Mobility in soil: No data available PBT and vPvB assessment: No data available

Other adverse effects: An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Section 13 **Disposal Considerations**

These disposal guidelines are intended for the disposal of catalog-size quantities only. Federal regulations may apply to empty container. State and/or local regulations may be different. Dispose of in accordance with all local, state and federal regulations or contract with a licensed chemical disposal agency. sport Information (US DOT / CANADA TDG) ection 14

| 0000001114 | manoport informa | | | | | | |
|--|-------------------------------|--|--------------------------------|-------------------------|--------------------|------------------|---|
| UN/NA number: Hazard class: No Exceptions: Not | ot applicable | Shipping name: Packing group: 2016 ERG Guide | 0 | Reportable Qua | antity: No | Ма | arine pollutant: No |
| Section 15 | Regulatory Informa | tion | | | | | |
| A chemical is considere | d to be listed if the CAS nur | nber for the anhydrous f | form is on the Inventory list. | | | | |
| Compone | ent | TSCA | CERLCA (RQ) | RCRA code | DSL | NDSL | CA Prop 65 |
| All components listed | d with TSCA. | | | | | | This product does not contain any chemicals known to the State of California to cause cancer or reproductive toxicity. |
| Section 16 | Other Information | | | | | | |
| The information contain | ed berein is furnished witho | ut warranty of any kind | Employers should use this | nformation only as a su | innlement to other | information dath | ered by them and must make indepen |

dent determinations of suitability and completeness of information from all sources to assure proper use of these materials and the safety and health of employees. NTP: National Toxicology Program, IARC: International Agency for Research on Cancer, OSHA: Occupational Safety and Health Administration, STOT: Specific Target Organ Toxicity, SE: Single Exposure, RE: Repeated Exposure, ERG: Emergency Response Guidebook Form 06/2015

| Section 1 | Chemical Product and Company Identification | Page E1 of E2 |
|--|---|---|
| 665 Carbon S Billings, MT 5 800-860-6272 | 59102 | CHEMTREC 24 Hour Emergency USA Phone Number (800) 424-9300 1 703-741-5500 (from anywhere in the world). For laboratory and industrial use only. Not for drug, food or household use. |
| Product | 2,6-DICHLOROINDOPHENOL, SODIUM SALT | |
| Synonyms | DPIP / Dichloroindophenol | |
| Section 2 | Hazards Identification | |
| to the Global Chemicals. Signal word: Pictograms: Target organ GHS Classifi GHS Label ir | nce or mixture has not been classified as hazardous according Ily Harmonized System (GHS) of Classification and Labeling of No symbol required is: None known ication: None required information: Hazard statement: None required ry statement: None required | Supplemental information: Do not breathe dust. Do not get in eyes, on skin, or on clothing. Wear protective gloves/protective clothing/eye protection/face protection. Wash hands thoroughly after handling. Get medical attention if you feel unwell. |

Hazards not otherwise classified:

Health hazards not otherwise classified (HHNOC) - Not Known Physical hazards not otherwise classified (PHNOC) - Not Known

| Section 3 | Composition / Information on | Ingredients | | | |
|------------------------|------------------------------|-------------|---------|-----------|--|
| Chemical Name | | CAS # | % | EINECS | |
| 2,6-Dichloroindophenol | Ι | 620-45-1 | min 99% | 210-640-4 | |
| Section 4 | First Aid Measures | | | | |

INGESTION: Call physician or Poison Control Center immediately. Induce vomiting only if advised by appropriate medical personnel. Never give anything by mouth to an unconscious person.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

EYE CONTACT: Check for and remove contact lenses. Flush thoroughly with water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get immediate medical attention.

SKIN ABSORPTION: Remove contaminated clothing. Flush thoroughly with mild soap and water. If irritation occurs, get medical attention.

Section 5 Fire Fighting Measures

Suitable Extinguishing Media: Carbon dioxide, dry chemical, dry sand, alcohol foam.

Protective Actions for Fire-fighters: In fire conditions, wear a NIOSH/MSHA-approved self-contained breathing apparatus and full protective gear. Use water spray to keep fire-exposed containers cool.

Specific Hazards: During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Section 6 Accidental Release Measures

Personal Precautions: Evacuate personnel to safe area. Use proper personal protective equipment as indicated in Section 8. Provide adequate ventilation.

Environmental Precautions: Avoid runoff into storm sewers and ditches which lead to waterways.

Containment and Cleanup: Recover for reuse if not contaminated. Sweep or vacuum up and place in a suitable container for proper disposal. Wash spill area with soap and water.

Section 7 Handling & Storage

Precautions for Safe Handling: Read label on container before using. Do not wear contact lenses when working with chemicals. Keep out of reach of children. Avoid contact with eyes, skin and clothing. Do not inhale dusts. Use with adequate ventilation. Avoid ingestion. Wash thoroughly after handling. Remove and wash clothing before reuse.

Conditions for Safe Storage: Moisture and light sensitive. Store in a cool, dry, well-ventilated area away from incompatible substances.

| Section 8 | Exposure Controls / Personal Pro | tection | | |
|------------------|----------------------------------|-----------------|-----------------|-----------------|
| Exposure Limits: | Chemical Name | ACGIH (TLV) | OSHA (PEL) | NIOSH (REL) |
| Exposure Linits. | 2,6-Dichloroindophenol | Not established | Not established | Not established |

Engineering controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower and fire extinguishing material. Personnel should wear safety glasses, goggles, or faceshield, lab coat or apron, appropriate protective gloves. Use adequate ventilation to keep airborne concentrations low.

Respiratory protection: None should be needed in normal laboratory handling at room temperatures. If dusty conditions prevail, work in fume hood or wear a NIOSH/MSHAapproved respirator.

| approved respirator Section 9 | Physical & Chemic | al Properties | | | | | |
|---|---|--|--|---|--|--------------------------------------|---|
| Appearance: Solid Odor: No odor. Odor threshold: D pH: Data not availa | d. Dark green powder. Data not available able point: Data not available composes | Evaporat Flammab Explosion Vapor pre e Vapor de Relative d | ion rate (=1): Data not ility (solid/gas): Not appl n limits: Lower / Upper: ssure (mm Hg): Negligib nsity (Air = 1): Data not a density (Specific gravity) (ies): Soluble in water. | icable Not applicable le vailable | Auto-ignit Decompos Viscosity: Molecular | | : Data not available re: Data not available ole |
| Section 10 | Stability & Reactiv | ity | | | | | |
| Chemical stability: Conditions to avoi | | | zardous polymerization: contact with moisture and | | | | |
| | erials: Strong oxidizers. | | | 5 | | | |
| Hazardous decom | position products: Car | bon oxides, nitroger | n oxides, chlorine. | | | | |
| Section 11 | Toxicological Infor | mation | | | | | |
| Acute toxicity: Da | - | | | | | | |
| IARC: No compone OSHA: No compone Reproductive toxi | ent of this product present | t at levels greater th | n or equal to 0.1% is ident an or equal to 0.1% is ider nan or equal to 0.1% is ide | tified as probable, p | ossible or confi | rmed human card | 0 , |
| STOT-repeated ex Aspiration hazard Potential health ef Inhalation: May cau Ingestion: May be Skin: Contact with Eyes: Contact with Signs and sympto | use respiratory irritation. harmful if swallowed. skin may cause irritation. e eyes may cause irritation oms of exposure: To the | ble n. a best of our knowled | | and toxicological pro | operties have n | ot been thorough | ily investigated. Specific dat |
| STOT-repeated ex Aspiration hazard Potential health ef Inhalation: May cau Ingestion: May be I Skin: Contact with Eyes: Contact with Signs and sympto not available. Exer Additional information | posure: Data not available ffects: use respiratory irritation. harmful if swallowed. skin may cause irritation. owns of exposure: To the rcise appropriate procedu ation: RTECS #: GU545 | ble n. e best of our knowled res to minimize pote 95000 | | and toxicological pro | operties have n | ot been thorough | ily investigated. Specific dat |
| STOT-repeated ex Aspiration hazard Potential health ef Inhalation: May car Ingestion: May be Skin: Contact with Eyes: Contact with Signs and sympto not available. Exer | posure: Data not available : Data not available ffects: use respiratory irritation. harmful if swallowed. skin may cause irritation. a yes may cause irritation oms of exposure: To the rcise appropriate procedu ation: RTECS #: GU548 Ecological Informa | ble n. e best of our knowled res to minimize pote 95000 | | and toxicological pro | operties have n | ot been thorough | ıly investigated. Specific dat |
| STOT-repeated ex Aspiration hazard Potential health ef Inhalation: May cau Ingestion: May be I Skin: Contact with Eyes: Contact with Signs and sympto not available. Exer Additional informa Section 12 Toxicity to fish: N Toxicity to fish: N Toxicity to daphnia Toxicity to daphnia Toxicity to algae: N Persistence and du Mobility in soil: No Other adverse effe Section 13 These disposal gu | posure: Data not availal Data not available ffects: use respiratory irritation. harmful if swallowed. skin may cause irritation. oms of exposure: To the crise appropriate procedu ation: RTECS #: GU549 Ecological Informa to data available a and other aquatic inve No data available egradability: No data available acts: An environmental h Disposal Consider uidelines are intended | ble n. best of our knowley res to minimize pote 95000 Ition ertebrates: No data vailable Bioac PBT a variazard cannot be exi rations for the disposal of | available available aud vPvB assessment: No cluded in the event of unpr catalog-size quantities | o data available lo data available ofessional handling only. Federal regu | or disposal. Ilations may a | ipply to empty c | container. State and/or loc |
| STOT-repeated ex Aspiration hazard Potential health ef Inhalation: May cau Ingestion: May be I Skin: Contact with Eyes: Contact with Eyes: Contact with Signs and sympto not available. Exer Additional informa Section 12 Toxicity to fish: N Toxicity to fish: N Toxicity to daphnia Toxicity to daphnia Toxicity to algae: N Persistence and du Mobility in soil: No Other adverse effe Section 13 These disposal gu | posure: Data not availal Data not available ffects: use respiratory irritation. harmful if swallowed. skin may cause irritation. oms of exposure: To the crise appropriate procedu ation: RTECS #: GU549 Ecological Informa to data available a and other aquatic inve No data available egradability: No data available acts: An environmental h Disposal Consider uidelines are intended | ble n. best of our knowley res to minimize pote 95000 ation ertebrates: No data vailable Bioac PBT a azard cannot be ex- rations for the disposal of f in accordance w | available available aud vPvB assessment: No cluded in the event of unpr catalog-size quantities ith all local, state and fee | o data available lo data available ofessional handling only. Federal regu | or disposal. Ilations may a | ipply to empty c | container. State and/or loc |
| STOT-repeated ex Aspiration hazard Potential health ef Inhalation: May cau Ingestion: May be I Skin: Contact with Eyes: Contact with Signs and sympto not available. Exer Additional informa Section 12 Toxicity to fish: N- Toxicity to fish: N- Toxicity to algae: N- Persistence and de Mobility in soil: N- Other adverse effe Section 13 These disposal guregulations may b Section 14 | posure: Data not available ffects: use respiratory irritation. harmful if swallowed. skin may cause irritation. oms of exposure: To the rcise appropriate procedu ation: RTECS #: GU549 Ecological Informa to data available egradability: No data available egradability: No data available ects: An environmental h Disposal Consider uidelines are intended be different. Dispose o Transport Informa | ble n. best of our knowley res to minimize pote 95000 tion ertebrates: No data vailable Bioac PBT a hazard cannot be ex- rations for the disposal of f in accordance w tion (US DOT / C/ | available available aud vPvB assessment: No cluded in the event of unpr catalog-size quantities ith all local, state and fee | o data available lo data available ofessional handling only. Federal regu | or disposal. Ilations may a | ipply to empty c | container. State and/or loc |
| STOT-repeated ex Aspiration hazard Potential health ef Inhalation: May cau Ingestion: May cau Ingestion: May cau Ingestion: May be I Skin: Contact with Eyes: Contact with Signs and sympto not available. Exer Additional informa Section 12 Foxicity to fish: Nu Toxicity to fish: Nu Toxicity to daphnia Foxicity to daphnia Foxicity to algae: N Persistence and de Mobility in soil: Nu Other adverse effe Section 13 These disposal gu regulations may b Section 14 UN/NA number: Hazard class: N | posure: Data not availal Data not available ffects: use respiratory irritation. harmful if swallowed. skin may cause irritation. oms of exposure: To the rcise appropriate procedu ation: RTECS #: GU543 Ecological Informa to data available a and other aquatic inve No data available egradability: No data available ects: An environmental h Disposal Consider uidelines are intended be different. Dispose o Transport Informa Not applicable Jot applicable | ble n. best of our knowley res to minimize pote 95000 ation ertebrates: No data vailable Bioac PBT a bioac PBT a in accordance w ation (US DOT / C/ Shipping name Packing group | available available and vPvB assessment: North Cluded in the event of unpr catalog-size quantities th all local, state and fer ANADA TDG) | o data available lo data available ofessional handling only. Federal regu | or disposal. Ilations may a r contract with | ipply to empty o n a licensed che | container. State and/or loc |
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Form 06/2015

Section 1 Chemical Product and Company Identification

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Page E1 of E2 CHEMTREC 24 Hour Emergency USA

Phone Number (800) 424-9300 1 703-741-5500 (from anywhere in the world). For laboratory and industrial use only.

Not for drug, food or household use.

Product IODINE-POTASSIUM IODIDE SOLUTION

Synonyms Iodine-Iodide / Iodine Solution / Iodine / Iodine Lugol's Dilute / Gram's Iodine Solution / Dilute Lugol's Solution

Section 2 Hazards Identification

Signal word: WARNING

Pictograms: GHS07 / GHS09 Target organs: Thyroid, kidneys, endocrine system, skin, eyes, reproductive system. central nervous system.



GHS Classification:

Acute toxicity, dermal (Category 4) Acute toxicity, inhalation (Category 4) Aquatic toxicity, acute (Category 1)

GHS Label information: Hazard statement(s):

H312: Harmful in contact with skin. H332: Harmful if inhaled.

H400: Very toxic to aquatic life.

Precautionary statement(s):

P261: Avoid breathing mist/vapours/spray.
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P302+P352: IF ON SKIN: Wash with plenty of water and soap.
P312: Call a POISON CENTER or doctor if you feel unwell.
P362+P364: Take off contaminated clothing and wash it before reuse.
P304+P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P312: Call a POISON CENTER or doctor if you feel unwell.
P312: Call a POISON CENTER or doctor if you feel unwell.
P391: Collect spillage.
P501: Dispose of contents/container to a licensed chemical disposal agency in accordance with local/regional/national regulations.

Hazards not otherwise classified:

Health hazards not otherwise classified (HHNOC) - Not Known Physical hazards not otherwise classified (PHNOC) - Not Known

| Section 3 | Composition / Information on | Ingredients | | | |
|-------------------------------------|------------------------------|-------------------------------------|--------------------------|-------------------------------------|--|
| Chemical Name | | CAS # | % | EINECS | |
| Water Potassium iodide Iodine | | 7732-18-5 7681-11-0 7553-56-2 | 95.10% 3.05% 1.85% | 231-791-2 231-659-4 231-442-4 | |
| Section 4 | First Aid Measures | | | | |

INGESTION: MAY BE HARMFUL IF SWALLOWED. Call physician or Poison Control Center immediately. Induce vomiting only if advised by appropriate medical personnel. Never give anything by mouth to an unconscious person.

INHALATION: HARMFUL IF INHALED. Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention. Harmful if inhaled.

EYE CONTACT: MAY CAUSE IRRITATION. Check for and remove contact lenses. Flush thoroughly with water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get immediate medical attention.

SKIN ABSORPTION: HARMFUL IN CONTACT WITH SKIN. Remove contaminated clothing. Flush thoroughly with mild soap and water. If irritation occurs, get medical attention. Harmful in contact with skin.

Section 5 Fire Fighting Measures

Extinguishing Media: Use any media suitable for extinguishing supporting fire.

General information: In fire conditions, wear a NIOSH/MSHA-approved self-contained breathing apparatus and full protective gear. Use water spray to keep fire-exposed containers cool.

Specific Hazards: In fire conditions, water may evaporate from this solution which may cause hazardous decomposition products to be formed as dust or fume.

Section 6 Accidental Release Measures

Personal Precautions: Evacuate personnel to safe area. Use proper personal protective equipment as indicated in Section 8. Provide adequate ventilation.

Environmental Precautions: Avoid runoff into storm sewers and ditches which lead to waterways.

Containment and Cleanup: Absorb with inert dry material, sweep or vacuum up and place in a suitable container for proper disposal. Wash spill area with soap and water.

Section 7 Handling & Storage

Read label on container before using. Do not wear contact lenses when working with chemicals. Keep container tightly closed. Keep out of reach of children. Use with adequate ventilation. Wash thoroughly after handling.

Handling: Use with adequate ventilation. Avoid contact with eyes, skin and clothing. Avoid ingestion. Do not inhale vapors, mist or spray. Wash thoroughly after handling. Remove and wash clothing before reuse.

Storage: Store in a cool, well-ventilated area away from incompatible substances. Section 8 **Exposure Controls / Personal Protection** Chemical Name ACGIH (TLV) OSHA (PEL) NIOSH (REL) Exposure Limits: TWA: 0.01 ppm^(IFV)/ STEL: 0.1 ppm^(V) Iodine CAS # 7553-56-2 STEL: C 0.1 ppm/C 1 mg/m³ STEL: C 0.1 ppm/C 1 mg/m³ Engineering controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower and fire extinguishing material. Personnel should wear safety glasses, goggles, or faceshield, lab coat or apron, appropriate protective gloves. Use adequate ventilation to keep airborne concentrations low. Respiratory protection: None should be needed in normal laboratory handling at room temperatures. If misty conditions prevail, work in fume hood or wear a NIOSH/MSHAapproved respirator. **Physical & Chemical Properties** Section 9 Appearance: Deep amber liquid. Evaporation rate (Water = 1): < 1 Partition coefficient: (n-octanol / water): Not applicable Odor: Characteristic odor Flammability (solid/gas): Not applicable. Auto-ignition temperature: Not applicable Odor threshold: Not applicable. Explosion limits: Lower / Upper: Not applicable Decomposition temperature: Data not available. pH: Data not available. Vapor pressure (mm Hg): 14 [water] Viscosity: Data not available. Melting / Freezing point: ~ 0°C (~ 32°F) [water] Vapor density (Air = 1): 0.7 [water] Molecular formula: Mixture Boiling point: ~ 100°C (212°F) [water] Relative density (Specific gravity): 1.0 [water] Molecular weight: Mixture Flash point: Not flammable. Solubility(ies): Complete in water. Section 10 Stability & Reactivity Chemical stability: Stable Hazardous polymerization: Will not occur. Conditions to avoid: Stable under recommended storage conditions. Excessive temperatures which cause evaporation. Incompatibilities with other materials: Metals or unsaturated organic compounds, ammonia solutions or alkaline solutions of ammonia salts. Will form explosive nitrogen iodides when reacted with gaseous ammonia. Hazardous decomposition products: Toxic iodide fumes Section 11 **Toxicological Information** Acute toxicity: Oral-Rat LD50: 14,000 mg/kg [lodine CAS # 7553-56-2] Skin corrosion/irritation: Data not available Serious eve damage/irritation: Data not available Respiratory or skin sensitization: Inhalation-rat 3.1 mg/m3 / 24 hour / 13 weeks - continuous [lodine CAS # 7553-56-2] Germ cell mutagenicity: Data not available Carcinogenity: Data not available IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC. NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA. Reproductive toxicity: Data not available STOT-single exposure: Data not available STOT-repeated exposure: Data not available Aspiration hazard: Data not available Potential health effects: Inhalation: Symptoms include cough, wheezing, and labored breathing. Symptoms may be delayed. Ingestion: Causes abdominal pain, diarrhea, nausea, and vomiting. Ingestion of levels of 2-3 grams of iodine may cause death. Skin: Contact may cause redness and pain. Eyes: Contact causes watering of the eyes, redness and pain. Signs and symptoms of exposure: Effects of short-term exposure: Lachrymator. The substance is severely irritating to the eyes and the respiratory tract, and is irritating to the skin. Inhalation of the vapor may cause asthma-like reactions. Inhalation of the vapor may cause lung edema. The effects may be delayed. Effects of long-term exposure: Repeated or prolonged contact may cause skin sensitization in rate cases. Repeated or prolonged inhalation exposure may cause asthma-like syndrome. The substance may have effects on the thyroid. Specific data not available for this mixture. Exercise appropriate procedures to minimize potential hazards.. Additional information: RTECS #: NN1575000 [lodine CAS # 7553-56-2] Section 12 **Ecological Information** Toxicity to fish: Very toxic to aquatic life. Toxicity to daphnia and other aquatic invertebrates: No data available Toxicity to algae: No data available Persistence and degradability: No data available Bioaccumulative potential: No data available Mobility in soil: No data available PBT and vPvB assessment: No data available Other adverse effects: An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. **Disposal Considerations** Section 13 These disposal guidelines are intended for the disposal of catalog-size quantities only. Federal regulations may apply to empty container. State and/or local regulations may be different. Dispose of in accordance with all local, state and federal regulations or contract with a licensed chemical disposal agency. Transport Information (US DOT / CANADA TDG) Section 14 UN/NA number: Not applicable Shipping name: Not Regulated Hazard class: Not applicable Packing group: Not applicable Reportable Quantity: No Marine pollutant: No Exceptions: Not applicable 2016 ERG Guide # Not applicable **Regulatory Information** Section 15 A chemical is considered to be listed if the CAS number for the anhydrous form is on the Inventory list. CERLCA (RQ) RCRA code DSL NDSL Component TSCA CA Prop 65 This product does not contain lodine Listed Not listed Not listed Listed Not listed any chemicals known to the State Potassium iodide Listed Not listed Not listed Listed Not listed of California to cause cancer or reproductive toxicity. Section 16 **Other Information** The information contained herein is furnished without warranty of any kind. Employers should use this information only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use of these materials and the safety and health of employees. NTP: National Toxicology Program, IARC: International Agency for Research on Cancer, OSHA: Occupational Safety and Health Administration, STOT: Specific Target Organ Toxicity, SE: Single Exposure, RE: Repeated Exposure,

ERG: Emergency Response Guidebook

Section 1 Chemical Product and Company Identification

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CHEMTREC 24 Hour Emergency USA Phone Number (800) 424-9300 1 703-741-5500 (from anywhere in the world).

For laboratory and industrial use only. Not for drug, food or household use.

Health hazards not otherwise classified (HHNOC) - Not Known Physical hazards not otherwise classified (PHNOC) - Not Known

| Section 3 Composition | on / Information on Ingredients | | | |
|---------------------------------|---------------------------------|--------|----------------|--|
| Chemical Name | CAS # | % | EINECS | |
| Water | 7732-18-5 | 90.03% | 231-791-2 | |
| Sodium hydroxide | 1310-73-2 | 6.42% | 215-185-5 | |
| Potassium sodium tartrate | 6381-59-5 | 2.00% | 206-156-8 | |
| Cupric sulfate, pentahydrate | 7758-99-8 | 1.18% | 231-847-6 | |
| Potassium iodide | 7681-11-0 | 0.35% | 231-659-4 | |
| Ethylenediaminetetraacetic acid | 6381-92-6 | 0.02% | None assigned. | |

Section 4 First Aid Measures

INGESTION: MAY BE FATAL IF SWALLOWED. Call physician or Poison Control Center immediately. Induce vomiting only if advised by appropriate medical personnel. Never give anything by mouth to an unconscious person.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

EYE CONTACT: CAUSES SEVERE DAMAGE. Check for and remove contact lenses. Flush thoroughly with water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get immediate medical attention.

SKIN ABSORPTION: CAUSES SEVERE BURNS. Remove contaminated clothing. Flush thoroughly with mild soap and water. If irritation occurs, get medical attention.

Section 5 Fire Fighting Measures

Suitable Extinguishing Media: Dry chemical, water spray, alcohol foam. Can react with carbon dioxide to form sodium carbonate.

Protective Actions for Fire-fighters: In fire conditions, wear a NIOSH/MSHA-approved self-contained breathing apparatus and full protective gear. Use water spray to keep fire-exposed containers cool.

Specific Hazards: In fire conditions, water may evaporate from this solution which may cause hazardous decomposition products to be formed as dust or fume. Contact with metals can generate hydrogen gas.

Section 6 Accidental Release Measures

Personal Precautions: Evacuate personnel to safe area. Use proper personal protective equipment as indicated in Section 8. Provide adequate ventilation.

Environmental Precautions: Avoid runoff into storm sewers and ditches which lead to waterways.

Containment and Cleanup: Absorb with inert dry material, sweep or vacuum up and place in a suitable container for proper disposal. Wash spill area with soap and water.

Section 7 Handling & Storage

Precautions for Safe Handling: Read label on container before using. Do not wear contact lenses when working with chemicals. Keep out of reach of children. Avoid contact with eyes, skin and clothing. Do not inhale vapors, spray or mist. Use with adequate ventilation. Avoid ingestion. Wash thoroughly after handling. Remove and wash clothing before reuse.

Conditions for Safe Storage: Store in a cool, well-ventilated area away from incompatible substances.

| Section 8 | Exposure Controls / Personal Pro | tection | | |
|------------------|----------------------------------|-----------------------------|--------------------------|-----------------------------|
| Exposure Limits: | Chemical Name | ACGIH (TLV) | OSHA (PEL) | NIOSH (REL) |
| Exposure Linits. | Sodium hydroxide | STEL: C 2 mg/m ³ | TWA: 2 mg/m ³ | STEL: C 2 mg/m ³ |

Engineering controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower and fire extinguishing material. Personnel should wear safety glasses, goggles, or faceshield, lab coat or apron, appropriate protective gloves. Use adequate ventilation to keep airborne concentrations low.

Respiratory protection: None should be needed in normal laboratory handling at room temperatures. If misty conditions prevail, work in fume hood or wear a NIOSH/MSHAapproved respirator

| Section 9 | | | | | | | |
|--|--|---|--|---|--|---|---|
| Section 9 | Physical & Chemical Prop | oerties | | | | | |
| | Not applicable. able. point: ~ 0°C (~ 32°F) [water] 00°C (212°F) [water] | Flammability (Explosion limit Vapor pressure Vapor density Relative densit | tte (Water = 1): < 1 solid/gas): Not applica ts: Lower / Upper: No e (mm Hg): 14 [water] (Air = 1): 0.7 [water] ty (Specific gravity): 1. Complete in water. | t applicable | Auto-igniti Decompos Viscosity: Molecular | on temperature | е |
| Section 10 | Stability & Reactivity | | | | | | |
| Incompatible mat | y: Stable oid: Can react with carbon dioxide erials: Metals, acids, organic con nposition products: Sodium oxide | e to form sodium o npounds, organic | nitro compounds. | | Irogen gas. | | |
| Section 11 | Toxicological Information | | | | | | |
| Respiratory or sk Germ cell mutage Carcinogenity: D NTP: No compone IARC: No compone OSHA: No compon Reproductive tox STOT-single expo | age/irritation: Eyes - rabbit - Sev in sensitization: Data not available parterity: Data not available bata not available ent of this product present at levels ent of this product present at level nent of this product present at leve icity: Data not available psure: Data not available | greater than or e s greater than or or | equal to 0.1% is identifie equal to 0.1% is identifie | d as a known or ar ed as probable, po | ssible or confi | med human car | 0, |
| Aspiration hazard Potential health e Inhalation: May be Skin: May be harr Eyes: Causes eye Signs and sympt edema, burning se and upper respirat | kposure: Data not available d: Data not available iffects: a harmful if inhaled. Material is ext harmful if swallowed. mful if absorbed through skin. Cau: a burns. Causes severe eye burns coms of exposure: Spasm, inflamentsation, cough, wheezing, laryngi ory tract, eyes, and skin. | ses skin burns. mation and eden tis, shortness of b | na of the larynx, spasm, preath, headache, nause | inflammation and o | edema of the l | pronchi, pneumo | |
| Aspiration hazard Potential health e Inhalation: May be Ingestion: May be Skin: May be harr Eyes: Causes eyet eiges and sympt edema, burning se and upper respirat Additional inform Section 12 | kposure: Data not available data not available diffects: a harmful if inhaled. Material is ext harmful if swallowed. mful if absorbed through skin. Cause burns. Causes severe eye burns coms of exposure: Spasm, inflamentation, cough, wheezing, laryngi ory tract, eyes, and skin. hation: RTECS #: WB4900000 [S Ecological Information | ses skin burns. mation and eden tis, shortness of b Sodium hydroxide | na of the larynx, spasm, oreath, headache, nause] | inflammation and ea, vomiting. Mate | edema of the l | pronchi, pneumo | |
| Aspiration hazard Potential health e Inhalation: May be Ingestion: May be harr Eyes: Causes eye Signs and sympto edema, burning se and upper respirat Additional inform Section 12 Toxicity to fish: L Toxicity to fish: L Toxicity to daphn Toxicity to algae: Persistence and c Mobility in soil: N | kposure: Data not available data not available ffects: a harmful if inhaled. Material is ext harmful if swallowed. nful if absorbed through skin. Cause a burns. Causes severe eye burns coms of exposure: Spasm, inflamensation, cough, wheezing, laryngi ory tract, eyes, and skin. lation: RTECS #: WB4900000 [S Ecological Information .C50 - Gambusia affinis (Mosquito ia and other aquatic invertebrate No data available degradability: No data available | ses skin burns. Imation and eden tis, shortness of t Sodium hydroxide fish) - 125 mg/l - es: Immobilization Bioaccumu PBT and vl | na of the larynx, spasm, preath, headache, nause] 96 h [Sodium hydroxide n EC50 - Daphnia - 40.3 ulative potential: No da PvB assessment: No da | inflammation and d ea, vomiting. Mate e] i8 mg/l - 48 h [Sodi ata available data available | edema of the l rial is extreme um hydroxide | pronchi, pneumo ly destructive to | |
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dent determinations of suitability and completeness of information from all sources to assure proper use of these materials and the safety and health of employees. NTP: National Toxicology Program, IARC: International Agency for Research on Cancer, OSHA: Occupational Safety and Health Administration, STOT: Specific Target Organ Toxicity, SE: Single Exposure, RE: Repeated Exposure, ERG: Emergency Response Guidebook. Form 06/2015