

MATERIAL SAFETY DATA SHEET

MATERIAL IDENTIFICATION

| | | | |
|-------------------------------------|--|--------------|---------------------|
| Technical Name Chlorine | Synonyms Bertholite | | |
| Chemical Formula Cl ₂ | Chemical Classification Inorganic Chemical | | Hazard Class 2&6 |
| CAS Registry No: No. | UN No: | HazChem Code | Hazardous Waste ID |
| 7782-50-5 | 1017 | 2XE | 17 |
| Product Use: | Used in the Pulp & Paper, Textile industries, Manufacture of Chemicals, Medicines, Bleaching Powder, PVC etc., and disinfecting water. | | |

HAZARDOUS INGREDIENTS

| Hazardous Ingredient | Concentration | CAS/UN No | LC 50 | LD 50 |
|----------------------|---------------|-----------|-------|-------|
| Chlorine | | | | |

PHYSICAL AND CHEMICAL PROPERTIES

| | | | | |
|------------------------------|----------------------|-----------------------------------|---------------|--|
| State | | Colour | | Odor |
| Liquefied Gas under pressure | | Greenish Yellow Gas | Amber- Liquid | Pungent and Choking odor |
| Molecular weight | Specific gravity | Water solubility | | pH |
| 71 | Liquid 1.468 at 20°C | Slightly soluble (Max 1% at 10°C) | | -- |
| Vapour pressure | | Vapour density | | Freezing Point |
| 6.3 atmp at 26°C | | 2.482 at 20°C | | -101°C |
| Melting Point | | Boiling Point | | Others |
| -- | | -34°C | | Critical Pressure-76.1atm Critical Temperature- 144°C |

FIRE /EXPLOSION HAZARD DATA

| | | | | |
|--------------------------------|--|----------------------------------|--|--|
| Flammability | | TDG Flammability | | Flash Point |
| Non Flammable | | --- | | --- |
| Auto Ignition temperature | | Explosive range | | Hazardous Combustion |
| products | | | | |
| --- | | LEL of Hydrogen Chlorine Mixture | | --- |
| Sensitivity to Chemical impact | | | | Sensitivity to static discharge |
| Stable | | | | Explosive in mixtures status with combustibles |

REACTIVITY DATA

| | | | |
|---|--|---|--|
| Chemical Stability | | Incompatibility | |
| Stable | | Ammonia, Acetylene, Metals, and Combustible materials | |
| Reactivity | | Dangerous reaction products | |
| Mixture of Chlorine and Hydrogen is explosive. | | | |
| Reacts with inorganic compounds such as lime, Caustic Soda, Soda ash and organic compounds such as hydro carbons, alcohols etc. | | Trichloribensodoxin | |

HEALTH HAZARD DATA

| | | |
|------------------------------------|---|------------------------------|
| Route of entry | Permissible limits | Lethal dose |
| Inhalation-skin contact, ingestion | TLV=1 PPM: 3Mg/M ³ STEL=3PPM: 9Mg/ M ³ | LC 50 (Rat) =2933 PPM/1 Hour |

Effects on acute exposure
Irritation of throat, intense cough, difficulty in breathing
Pulmonary edema, Chest pain, vomiting, collapse,
Freeze burns, irritation
Sensitization to Material
Data not available

Effects on Chronic exposure
Permanent loss in pulmonary function
Bronchitis, preposition to Tuberculosis

Synergistic materials
Data Not Available

PREVENTIVE MESURES

Storage requirement:

Handling Methods

Bulk Storage in Steel Tanks licenced under SMPV Rules Filled in steel tonners or cylinders for shipment

Seamless steel, seamless copper flexible piping are used for handling liquid Chlorine.

Engineering Controls

Personal protective equipments

Adequate ventilation, Spare tank for emergency
Transfer Dike wall, emergency scrubber etc.

Self contained Breathing Apparatus Gas filters
Protective Clothing

Contain leak, spill handling

If the leak in piping, shut off the Chlorine supply. If the leak is from cylinders, Position the cylinder so that leak will be in gaseous phase. Contain liquid spills.

Do not pour water on leak containers.

Waste disposal

Nueutralise the waste Chlorine or spills
With alkaline solution such as Caustic Soda,
Soda ash or slaked lime etc.

Special shipping information

Grades of Purity: Technical
Storage Temp : Ambient
Inert Atmosphere : Not required
Venting : No vents

EMERGENCY / FIRST-AID MEASURES

Fire extinguishment

Special procedure

Non Combustible Material

First Aid

Antidotes

Remove the victim from contaminated area. Remove contaminated clothing. Provide fresh air circulation. Oxygen can be administered by trained person. If breathing ceased, start artificial respiration.

ADDITIONAL INFORMATION

One volume of liquid Chlorine expands 457 volumes of gas. Position the leak container so that leak spot comes at top, only gas escape rather than liquid.

MANUFACTURE/SUPPLIER/CONSUMER DATA

The Andhra Sugars Limited

Chemicals & Fertilisers Division

Kovvur- 534350, A.P/Saggonda-534218

Aditya Birla Chemicals (India) Limited

POST-Jayashree, Dist-Ganjam

Odisha-761025

Phones: 08813-231597, 231598,231599

Grams : CHEMICALS

Fax : 08813-231218

Phones: 06811-254319, 254329

Fax : 06811-254384

MATERIAL SAFETY DATA SHEET

MATERIAL IDENTIFICATION

| | | | |
|---|--|---|--------------------------|
| Technical Name Hydrogen Peroxide | Synonyms Peroxide, Albone, Superoxol, Oxydol | Shipping Name Hydrogen Peroxide | |
| Chemical Formula H ₂ O ₂ | Chemical Classification Peroxide | Codes Label Oxidiser, Corrosive, Class-5 | |
| CAS Registry No. No. 7722-84-1 | UN No. 2015 | HazChem Code 2PE | Hazardous Waste ID 17 |
| Product Use: | Used in purifying coke and iron ores, pickling sheet iron, Regeneration of water treatment resins, photography, pharmaceutical Industries. | | |

HAZARDOUS INGREDIENTS

| Hazardous Ingredient | Concentration | CAS/UN No | LC 50 | LD 50 |
|----------------------|---------------|---------------------|-------|-------|
| Hydrogen Peroxide | | 7722-84-1/2015 ---- | ---- | |

PHYSICAL AND CHEMICAL PROPERTIES

| | | | |
|---|---|---|----|
| Boiling Range Point At 1 atm 125°C | Physical State Liquid | Appearance Colourless | |
| Melting /Freezing Point -0.43°C | Specific gravity Water=1 1.132 at 20°C (35% H ₂ O ₂) 1.95 at 20°C (50% H ₂ O ₂) | Solubility in Water at 30°C Infinite | pH |
| Vapour pressure@35°C : 01mm Hg at 15.3°C | Vapour density (Air=1) Not Available | | |

FIRE /EXPLOSION HAZARD DATA

| | | | |
|---|--------------------------|---|--|
| Flammability No | LEL Not Pertinent | Flash Point Not Pertinent | Auto Ignition temperature Not Pertinent |
| But may cause fire, react violently on contact with combustible & Metals. | | | |
| TDG Flammability | UEL Not Pertinent | Explosion Sensitivity to impact Unstable | |
| Hazardous Combustion Products Data not available | | Sensitivity to static discharge Data not available | |
| Hazardous Polymerisation Will not occur | Combustible Liquid No | Corrosive material Yes | |
| Flammable Material No | Oxidiser Yes | Others ---- | |
| Pyrophoric Material No | Organic Yes | Peroxide Yes | |

REACTIVITY DATA

| | |
|---------------------|---|
| Chemical Stability: | Rapid decomposes with dirt/metals with liberation of O ₂ gas. Occurs particularly if conc. is above 40%. Pure grade is stable. |
| Compatibility with | Oxidisable material, metals like Iron Copper, Brass, Bronze, Chromium, Zinc, Lead, Manganese, |

Other Materials: Silver, Catalytic metals.
Reactivity Violent reaction with Aluminium Isopropoxide & Heavy metal salts, Coal, Charcoal, Dimethyl Phenyl Phosphine, Hydrogen Selenide metals, Metal oxides
Hazardous Reaction Reacts with Acetic Acid, Acetaldehyde + Desiccants, Acetic Anhydride to form unstable explosive products.

HEALTH HAZARD DATA

Route of entry : Ingestion, Inhalation, Eye & Skin.
Effects of Exposure Symptoms: Although solutions & Vapours are non toxic, they are irritating. Vapours cause discomfort of eye & nose. Moderately conc. Liquid causes whitening of skin & severe stinging sensation can cause eye damage.
Emergency Treatment: Eyes- flush with plenty of water for 15 minutes, Skin- Remove the contaminated clothes & shoes. Flush the affected area with plenty of water. Inhalation- Remove the victim to fresh air area, Ingestion- Have victim drink water or milk, seek medical aid.
TLV TWA 1ppm 1.5mg/m³ STEL 2ppm 3 mg/m³
NFPA Hazard signal Health Flammability Stability Special
2 0 3 ---

PREVENTIVE MEASURES

Personal Protective Equipment: PVC lined or neoprene hand gloves, on line air apparatus, B.A. Set, Safety Goggles, Safety Shoes
Handling and Storage Precautions: Store in a cool dry well ventilated area away from heat or flame. Containers must be well covered, should be stored separately away from other chemicals.

EMERGENCY / FIRST-AID MEASURES

Fire
Fire extinguishment : Use Water. Do not use Dry Chemical Powder or Foam.
Special Procedures : Keep containers cool by spraying water if exposed to heat or flame.
Exposure
Unusual Hazards : Containers may explode in fire & combustibles
First Aid Measures : Same as Emergency Treatment
Antidotes/Dosages : Not Available
Spills
Steps to be taken : Shut off leaks if without risk. Drench with water. Do not absorb on saw dust or other combustible material.
Waste Disposal Method: Dilute it with plenty of water and drain in to sewer.

ADDITIONAL INFORMATION

The eyes are particularly sensitive to this material. It is used as general food additive. It migrates to food from packing materials.

MANUFACTURE/SUPPLIER DATA

Gujrat Alkalies and Chemicals Limited
P.O-Petrochemicals- 391346
Dist -Vadodara

Phones: +91-265-2232681-2
Fax : +91-265-2232130

MATERIAL SAFETY DATA SHEET

SECTION - I - MATERIAL IDENTIFICATION AND USE

Material Name / Identifier: Sulphur Dioxide (SO₂)

Manufacture's / Supplier's Name:

Nath Industrial Chemical Ltd
294-296, GIDC Industrial Estate
Phase-II, Vapi
Gujrat
Postal Code : 396195
Telephone No:0260-2424830

Manufacture's / Supplier's Name:

Shree Sulphurics Pvt. Ltd
Plot No- 2801/A, GIDC Estate,
Ankleshwar-393002
Dist- Bharuch,
Gujrat, India
Tel- 02646-222436,221335
FAX-02646-251836

Chemical Identity : Colourless

Trade Name and Synonyms : Bisulfite, Sulfurous Anhydride, Sulphurous Oxide.

Product Use : Bleaching of Pulp

SECTION - II - HAZARDOUS INGREDIENTS OF MATERIAL

| Hazardous Ingredients | Approximate Concentration % | C.A.S. or UN Numbers | LD 50 (Specify Species and Route) | LC 50 (Specify Species and Route) |
|--|-----------------------------|--------------------------------------|-----------------------------------|-----------------------------------|
| Non-Corrosive Material Cause Irritation of eyes and Lungs with severe choking. Vapours are poisonous if inhaled. | 100% | CAS No. 7446 - 09 - 5 UN No. 1079 | Not available | Not available |

SECTION - III - PHYSICAL DATA FOR MATERIAL

| | | | | |
|---|--|--|---|--|
| Physical State <input checked="" type="checkbox"/> Gas <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Solid | | Odour and Appearance Sharp pungent odour Colour less | Odour Threshold (p.p.m.) 3 ppm. 6.6 mg / M ³ | Specific Gravity (Water - l) 1.45 at - 10°C |
| Vapour Pressure @ 35°C 2538 mm Hg at 21.1°C | Vapour density (Air = 1) 2.264 at 0°C | Evaporation Rate Not listed | Boiling Point (°C) -10.0°C | Freezing : -75.5°C (°C) M.P : |
| Solubility in water (30°C) Sinks of boils | pH Acidic | Density(g/ml) 3.1 kg / m ³ | Coefficient of Water/Oil distribution Not listed. | |

SECTION - IV - FIRE AND EXPLOSION HAZARD OF MATERIAL

| | | |
|---|--|--|
| Flammability Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If yes, under what conditions | | |
| Means of Extinction Nil | | |
| Special Procedures Nil | | |
| Flash Point (°C) Not pertinent | Upper Explosion Limit (% by Volume) Not pertinent | Lower Explosion Limit (% by Volume) Not pertinent |
| Auto-ignition Temperature (°C) Not pertinent | TDG Flammability classification Not pertinent | Hazardous Combustion Emits toxic fumes of SOx. |
| Explosion Sensitivity to Chemical Impact : Stable | Sensitivity to Static Discharge: Stable | |

SECTION - V - REACTIVITY DATA

| | |
|--|---|
| Chemical Stability | |
| ✓ Yes | No If no under what conditions |
| Incompatibility to other substances | |
| ✓ Yes | No If yes, which ones. |
| Halogens or interhalogens, lithium Nitrate, Acetylene, metal oxides, Polymeric tubing, Potassium, Chlorate, Sodium Hydrides. | |
| Reactivity and under what conditions | |
| Reacts violently with acrylin, Al, Chlorates, ClF ₃ , Cr, FeO, F ₂ , Mn, KCl ₃ , Na C ₂ , SnO. Lithium acetylene carbide diamine. Phosphine, Hydrogen Selenide, Lithium acetylene carbide diamine. | |
| Hazardous Decomposition Products | |
| Reacts with water to produce toxic and Corrosive fumes. | |
| SECTION - VI - TOXICOLOGICAL PROPERTIES OF MATERIAL | |
| Route of Entry | |
| Yes Skin Contact | No Skin Absorption Yes Eye Contact |
| Yes Inhalation Acute | Yes Inhalation Chronic Yes Ingestion |
| Effects of Acute Exposure to Material Not listed | |
| Effects of Chronic Exposure to Material Not listed | |
| Exposure Limit(s) Irritancy of Material | |
| Sensitization to Material | Carcinogenicity, Reproductive Effects, Teratogenicity, Mutagenicity |
| Not available | Nil |
| Synergistic Materials Not available | |
| SECTION - VII - PREVENTIVE MEASURES | |
| Personal Protective Equipment | |
| Gloves (Specify) Rubber Hand Gloves | Respiratory (Specify) : - Air supplied masks & Canisters. |
| Footwear (Specify) Gum Boots | Clothing Specify Rubber/Plastic Apron |
| Eyes (Specify) Safety Goggles or face shield | Other Specify |
| Engineering Controls (e.g. Ventilation, enclosed process, etc.): | |
| Cylinders & storage tanks are kept in dry & well ventilated area. Diluted SO ₂ stored in FRP storage tank sent to consuming point through supply pump and FRP pipe. | |
| Leak and Spill Procedures | Shut off leaks if without risk, contain the spillage on sand or earth flush the area with water and soap. |
| Waste Disposal | Seal all waste in vapour tight plastic jars for eventual disposal. |
| Handling Procedures and Equipment | Through pipe line from storage tank (Diluted 2 to 2.5 gpl) |
| Storage Requirements | Bleaching of pulp. |
| Special Shipping Information | Code/label : Poisonous Gas, Class 2. |
| SECTION - VIII - FIRST AID MEASURES | |
| First Aid Measure | Not flammable, Do not use water Personnel at Chemical Plant are trained in First Aid. |
| Sources Used | First Aiders and Medical Practitioners of Company's dispensary & E.S.I. Hospital. |
| Additional Information : | The material is so irritating that it provides its own warning of toxic concentrations. 400 500 ppm is immediate danger to life . 50 to 100 ppm is considered to be maximum permissible concentration for exposure of 30 60 minutes. Excess exposure may be fat |
| SECTION - IX - PREPARATION DATE OF M.S.D.S. | |
| 20 - 09 -2002 | |

MATERIAL SAFETY DATA SHEET

MATERIAL IDENTIFICATION

| | | | |
|---|--|-----------------------------|--------------------------|
| Technical Name Sodium Hydroxide 50% Solution | Synonyms Caustic Soda Lye | | |
| Chemical Formula NaOH | Chemical Classification Alkaline Inorganic compound | Hazard Class Corrosive-8 | |
| CAS Registry No. 1310-72-2 | UN No. 1824 | HazChem Code 2R | Hazardous Waste ID 16 |
| Product Use: Manufacture of Rayon, Mercedised cotton, Paper, Soap etc., Extraction of Zinc, Petroleum Refining, Regeneration of Water Treatment Resins. | | | |

HAZARDOUS INGREDIENTS

| Hazardous Ingredient | Concentration | CAS/UN No | LC 50 | LD 50 |
|----------------------|---------------|-----------|-------|-------|
| Sodium Hydroxide | 50% | 1310-72-2 | | |

PHYSICAL AND CHEMICAL PROPERTIES

| | | | | |
|------------------------|----------------------------------|--|--------------|--|
| State Sopy liquid | Colour Colourless | Odour Odourless | | |
| Molecular weight 40 | Specefic gravity 1.53 at 20°C | Water solubility Soluble | pH 14 | |
| Vapour pressure --- | Vapour density --- | Freezing Point Crystalization : 12-15°C Solidification : 5°C | Others -- | |
| Melting Point -- | | Boiling Point 142-148°C | | |

FIRE /EXPLOSION HAZARD DATA

| | | |
|--|-------------------------|---|
| Flammability Non Flammable | TDG Flammability --- | Flash Point --- |
| Auto Ignition temperature products --- | Explosive range --- | Hazardous Combustion --- |
| Sensitivity to Chemical impact Stable | | Sensitivity to static discharge Stable |

REACTIVITY DATA

| | | |
|--|---|--|
| Chemical Stability Stable | Incompatibility Acids, Flammable Materials, Nitrocompounds, Aluminium and Zinc | |
| Reactivity Reacts violently with acids, Organic halides, Nitrocompounds | Dangerous reaction products Hydrogen Gas | |

HEALTH HAZARD DATA

| | | |
|---|----------------------------|------------------------------------|
| Route of entry | Permissible limits | Lethal dose |
| Skin Contact, Ingestion | TVL(C) =3Mg/M ³ | LDLO (Rabbit) =500Mg/Kg |
| Effects on acute exposure | | Effects on Chloric exposure |
| Eyes : Severe irritation, Burns | | Tissue damage in Respiratory Tract |
| Skin : Irritation, inflammation | | Dermatitis |
| Ingestion : Inflammation, Scar, perforation | | |

Sensitization to Material
Stable

Synergistic materials
Data Not Available

PREVENTIVE MESURES

Storage requirement:

Handling Methods

Bulk Storage in Mild Steel Tanks
piping

Pumping through M.S or rigid PVC

Little Storages in Metal/ Plastic Drums or Carboys

Tripplers, Syphon Pump used drums unloading.

Engineering Controls

Personal protective equipments

Dike Wall around storage tanks

Face shield, Rubber hand gloves, Gun
Boot, Protective Clothing

Leak, spill handling

Contain leak, spill to prevent enter into drains.

Flush out spills with large quantities of water.

Washing shall be neutralized before disposal.

Waste disposal

Special shipping information

Dilution and neutralization of
Effluent water

Grades of Purity : Technical , Lye 50%

Storage Temp : Ambient

Inert Atmosphere : Not required

Venting : Open

EMERGENCY / FIRST-AID MEASURES

Fire extinguishment

Special procedure

Non Combustible Material

First Aid

Antidotes

Eye / Skin: Affected area should be washed with running water at least for 15 minutes.

Ingestion: Rinse mouth several times. Do not induce vomiting, large intake of water. Get Medical attention.

ADDITIONAL INFORMATION

Drench water shower with eye wash fountain must be installed near the caustic handling area.

MANUFACTURE/SUPPLIER/CONSUMER DATA

The Andhra Sugars Limited

Phones: 08813-231597, 231598,231599

Chemicals & Fertilisers Division

Grams : CHEMICALS

Kovvur- 534350, A.P/Saggonda-534218

Fax : 08813-231218

Aditya Birla Chemicals (India) Limited

Phones: 06811-254319, 254329

POST-Jayashree, Dist-Ganjam

Fax : 06811-254384

Odisha-761025

MATERIAL SAFETY DATA SHEET

MATERIAL IDENTIFICATION

| | | | |
|---|---|-----------------------------|--------------------------|
| Technical Name Hydrochloric Acid | Synonyms Muriatic Acid Hydrogen Chloride | | |
| Chemical Formula HCl | Chemical Classification Inorganic Acid | Hazard Class Corrosive-8 | |
| CAS Registry No. No. 7647-01-0 | UN No. 1789 | HazChem Code 2R | Hazardous Waste ID 16 |
| Product Use: Used in purifying coke and iron ores, pickling sheet iron, Regeneration of water treatment resins, photography, pharmaceutical Industries. | | | |

HAZARDOUS INGREDIENTS

| Hazardous Ingredient | Concentration | CAS/UN No | LC 50 | LD 50 |
|----------------------|---------------|-----------|-------|-------|
| Chlorine | | | | |
| Hydrogen | | | | |

PHYSICAL AND CHEMICAL PROPERTIES

| | | | |
|--------------------------------------|----------------------------------|-------------------------------|---------|
| State Aqueous Solution Pungent | Colour Colourless | Odour | |
| Molecular weight 36.47 | Specific gravity 1.19 at 20°C | Water solubility Dilutable | pH 1 |
| Vapour pressure 280mm Hg at 20°C | Vapour density 1.268 | Freezing Point -114.8°C | |
| Melting Point -- | Boiling Point 110°C | Others -- | |

FIRE /EXPLOSION HAZARD DATA

| | | |
|--|-------------------------|---|
| Flammability Non Flammable | TDG Flammability --- | Flash Point --- |
| Auto Ignition temperature products --- | Explosive range --- | Hazardous Combustion --- |
| Sensitivity to chemical impact Stable | | Sensitivity to static discharge Stable |

REACTIVITY DATA

| | |
|---|---|
| Chemical Stability Stable | Incompatibility Bases, Oxides, Oleum, Ethylene, Carbides, Common |
| Metals Reactivity Violent reaction with bases, Ammonia, | Dangerous reaction products |

Ethylene, Oleum etc.
Corrosive to many metals like Iron, Zinc, Aluminium

Chlorine, Hydrogen

HEALTH HAZARD DATA

| Route of entry dose | Permissible limits | Lethal |
|---|-----------------------------------|---------------|
| Skin Contact, Ingestion, Vapour Inhalation =900Mg/Kg | TVL(C) =5PPM: 7 Mg/M ³ | LDLO (Rabbit) |

Effects on acute exposure
Corrosive to human tissue, burns, Severe Irritation
Ulcers
Of respiratory tract, pulmonary edema

Effects on Chloric exposure
Dermatitis, Teeth Damage,

Sensitization to Material

Synergistic materials

PREVENTIVE MESURES

Storage requirement:

Handling Methods

Bulk Storage in M.S.Rubber Lined Tanks
Small quantities in Plastic Carboys.

Pumping through rubber lined or rigid PVC piping.

Engineering Controls

Personal protective equipments

Adequate ventilation, Acid resistant flooring, Dike Wall

Face shield, Hand Gloves, Gumboot,
Protective Clothing, Canister Gas Mask.

Leak, spill handling

Contain leak, spill to prevent enter into sewers.

Dilute spills with large amounts of water

Neutralise washings with soda ash.

Waste disposal

Special shipping information

Neutralise with Alkaline matter before disposal

Grades of Purity : Technical 36%
aqueous
Storage Temp : Ambient
Inert Atmosphere : Not required
Venting : Open

EMERGENCY / FIRST-AID MEASURES

Fire extinguishment

Special procedure

Non flammable

First Aid

Antidotes

Eye / Skin: Wash effected area with running water at least for 15 minutes. .

Ingestion: Large intake water.

ADDITIONAL INFORMATION

MANUFACTURE/SUPPLIER/CONSUMER DATA

The Andhra Sugars Limited

Phones: 08813-231597, 231598,231599

Chemicals & Fertilisers Division

Grams : CHEMICALS

Kovvur- 534350, A.P/Saggonda-534218

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Aditya Birla Chemicals (India) Limited

Phones: 06811-254319, 254329

POST-Jayashree, Dist-Ganjam, Odisha-761025

Fax : 06811-254384

MATERIAL SAFETY DATA SHEET

CHEMICAL IDENTITY

| | | |
|---|--|--|
| Technical Name Chlorine Dioxide | Shipping Name Chlorine Dioxide | Synonyms Chlorine Oxide, Chlorine Peroxide, Chloroperaxyl |
| Chemical Formula ClO ₂ | Chemical Classification Chlorine Compound | Codes/Label Oxidiser and Poison |
| CAS Registry No: No. | UN No: | HazChem Code Hazardous Waste ID |
| 10049-04-4 | Not Listed | Not Listed 17 |

HAZARDOUS INGREDIENTS

| Hazardous Ingredient | Concentration | CAS/UN No | LC 50 | LD 50 |
|----------------------|---------------|------------|-------|-------|
| Chlorine Dioxide | | 10049-04-4 | | |

PHYSICAL/CHEMICAL DATA

| | | |
|--|--|--|
| Physical State Gas or Liquid | Appearance Yellow/Green-Orange | Odour Pungent, Sharp Odour |
| Molecular weight | Specific Gravity Liquid 1.6 (Water=1) | Water solubility 0.8g/100g H ₂ O at 30°C |
| Pertinent Vapour pressure 760mm Hg at 20°C | Others | Melting / Freezing Point -59°C |
| Boiling Point 11°C | Soluble in Alkaline and H ₂ SO ₄ solutions | pH Not |

FIRE /EXPLOSION HAZARD DATA

| | | | | |
|---|--|--|----------------------|--------------------|
| Flammability Non Flammable Pertinent | TDG Flammability N.A | Flash Point Not Pertinent (OC & CC) | LEL Not Pertinent | UEL Not |
| Auto Ignition Temperature (°C) | : Not Pertinent | | | |
| Explosion Sensitivity to Static Electricity | : Explodes | | | |
| Hazardous Combustion Products | : Emits toxic fumes of Cl ₂ | | | |
| Hazardous Polymerisation | : Will not occur | | | |
| Combustible Liquid | : No | Explosive Material | : Yes | Corrosive Material |
| Flammable Material | : No | Oxidiser | : Yes | Others |
| Pyrophoric Material | : No | Organic Peroxide | : No | |

REACTIVITY DATA

| | |
|-------------------------------------|--|
| Chemical Stability | : Unstable in light, Stable in dark, if pure. |
| Incompatibility with other material | : Combustible substance, Dust, Organic Matter, Sulphur |
| Reactivity | : Reacts violently with Organic Matter, Mixture with Hydrogen, explodes with sparking, Reacts violently with F ₂ , NHF ₂ , Ignites or explodes on contact with non metals, Hg, KOH, PCl ₅ + Cl ₂ |
| Hazardous Reaction Products | : Reacts with water or steam to produce toxic and corrosive fumes of HCl. |

HEALTH HAZARD DATA

Routes of entry : Inhalation, Ingestion, Skin & Eyes.

Effects of Exposure/ Symptoms : Inhalation & Ingestion- Causes irritation to nose, throat, chronic bronchitis, pulmonary edema, wheezing skin, vapour causes severe irritation to eyes

Emergency Treatment : Inhalation- Remove the victim

to fresh air area and apply artificial respiration and

Oxygen if needed.
Ingestion: Give plenty of

water to drink. Do not induce vomiting.

Skin: Remove contaminated clothing and wash the affected area with plenty of water and soap.

Eyes: Flush with plenty of water for 15 mins. Seek medical aid immediately.

LD₅₀ (Oral- Rat) : 292 mg/Kg

STEL : 0.3ppm 0.9mg/m³

Permissible Exposure Limit: Not Listed

Odour Threshold 0.1ppm 0.3 mg/m³

TLV (ACGIH) : 0.1 PPM 0.3 mg/m³

NFPA Hazard : Health : Flammability : Reactivity : Special

Signals : Not Listed : Not Listed : Not Listed :

PREVENTIVE MESURES

Personnel : Avoid contact with vapour

Protective Equipment : Provide self contained breathing apparatus or on air line supply mask, side covered safety goggles / face shield, hand gloves, body over clothing and shoes.

Handling & Storage Precautions: Keep in cool, well ventilated area away from spark, flame and heat. Store in dark place.

EMERGENCY / FIRST-AID MEASURES

FIRE :

Fire Extinguishing Media: Not Flammable

Special Procedure : Keep the containers cool by spraying water if exposed to heat or flame.

Unusual Hazard : Poisonous gases are produced in fire.

EXPOSURE :

First Aid Measures: Inhalation: Remove the victim to fresh air area, apply artificial respiration and Oxygen if needed.

Ingestion: Give plenty of water to drink. Do not induce vomiting.

Skin: Remove the contaminated clothing and wash the affected area with plenty of water and soap.

Eyes: Flush with plenty of water for 15 min. Seek medical aid immediately.

Anti Dotes/ Dosages: Not Available

SPILLS :

Steps to be taken: Shut off leaks if in the gaseous form. If in the liquid form, evacuate all persons and allow ClO₂ to evaporate with ventilation.

Waste Disposal Method: Introduce into a large volume of solution of reducing agent, neutralise and flush with plenty of water.

ADDITIONAL INFORMATION

LcLo= 500ppm/15M (ihl-rat). A powerful Oxidiser and explosive material. A powerful explosive, sensitive to spark, impact, sunlight or heating rapidly to 100°C. Concentrations greater than 10% in air are explosive. Explodes on mixing with carbon Monoxide, Hydrocarbons (Butadiene, Ethane, Ethylene, Methane, Propane).

MANUFACTURE/SUPPLIER/CONSUMER DATA

J.K.Paper Mills

Phones: 06856-233770, 233550

At/PO-Jaykaypur, Dist-Rayagada

Fax : 06856-234078

Odisha-765017

MATERIAL SAFETY DATA SHEET

IDENTITY OF MATERIAL :

Material Name / Identifier : Light Diesel Oil (LDO)

Suppliers Name : Indian Oil Corporation Ltd. (MD)

Budharaja, Sambalpur- 4

Ph.No. 0663 - 2541858

Tele Fax No. 0663 - 2541859/860

| | | | | | |
|----------|----------------------------------|--------------|------|---------------|---------------|
| Formulla | Complex mixture of hydro carbons | UN No. | 1270 | Label / Class | Not regulated |
| | | CAS No. | | | |
| | | HAZCHEM Code | 3Y*E | | |

PHYSICAL & CHEMICAL PROPERTIES :

| | | | | | |
|------------------------------------|----------------|------------------------------------|--------------------------------|-----------------------|--------------------|
| Physical State | Liquid | Boiling Point / Range, deg. C | 185 - 500 | Vapour Pressure | <1mm Hg. 20 C |
| Appearance | Brown to Black | Melting / Freezing point, deg.C | 29 to 10 (at 38 deg C, mm Hg.) | at 20 deg. C mm Hg. | (approx) |
| Odor | Diesel Fuel | Vapour Density (Air = 1) | 3 to 5 | Evaporation rate | |
| Solubility in water | Insoluble | Specific gravity, 15.5 deg C | 0.9 to 1.05 | at 30 deg. C | |
| Calorific value : (Kcal / Kg.) | 4.34E + 07 | Dyn. Viscosity (P.A.S 30 deg. C) | | Heat of vaporisation, | 2.9E + 05 |
| | | Molecular weight : | | Kcal / kg | |
| | | | | | Sp. heat liq. J/KG |

FIRE AND EXPLOSION DATA :

| | | | | | |
|--------------------|---|----------------------------|------------|--------------|-----------------------------|
| Explosivity | | Auto Ignition Temp. deg. C | 263 to 407 | Flash Point | 66 ^o C and above |
| Flammability | Moderate | Explosive Limits, % | 1 to 5 | Burning Rate | 4mm / min |
| Extiguishing Media | Foam, CO ₂ , DCP, Water may be ineffective and cause fire to spread. May be used to cool fire exposed containers. | | | | |
| Spical Procedure | If a leak or spill has not ignited, use water spray to disperse the vapours and to provide for men attempting to stop aleak. Water spray may be used to flush spills away from exposure area. | | | | |
| Unusual Hazards | | | | | |

REACTIVE HAZARDS :

| | | | |
|---|------------------------------|---------------------|-----------------------------------|
| Stability | Stable | Conditions to avoid | Keep away from heat & open flame. |
| Hazardous poly | | Condition to avoid | |
| Incompatibility | Oxidising agents. | | |
| Hazardous Combustion / Decomposition products | Toxic gases / vapours (CO) | | |

HEALTH HAZARDS DATA :

| | | | | | |
|---|--|----------------------------|---------------------|-----------------------|-----|
| Entry Rout | Inhalation / Skin absorption | | | | |
| TLV,PPM, Mg/m ³ | 5 mg/m ³ (Inhalation) | STEL,PPM,Mg/m ³ | 10Mg/m ³ | Odor Threshold PPM | 0.1 |
| PEL,PPM,Mg/m ³ | LD50 oral, Rate g./ kg. | | | LDLo. Human, mg./kg. | |
| Sign / Symptoms of Exposure | Delayed Toxicity | | | | |
| Inhalation | Dizziness, Headache | | | | |
| Ingestion | Nausea, Vomiting. | | | | |
| Contact | Skin irritation,eye contact,Dermatities may result on prolonged contact. | | | | |
| Emergency Treatment (Immediate Medical Attention Required) | | | | | |
| Inhalation | Remove victim to fresh air, give artificial respiration if necessary. If unconscious but breathing place in the unconscious (recovery) position. Give external cardiac massage if necessary. | | | | |
| Ingestion | Do not induce vomiting as it may lead to chemical pneumonitis | | | | |
| Contact | Remove contaminated clothing and wash affected part (Skin / Eyes) with plenty of water, Kerosene / gasoline should never be used. | | | | |

HAZARD SPECIFICATION :

| | | | | | | |
|-------------|-----------|---|-------------|---|-----------------|----|
| NFPA Rating | Health | 0 | Flamability | 2 | Material factor | 10 |
| | Stability | 0 | Special | | | |

KNOWN HAZARDS :

| | | | | | |
|--------------------|--------------------|--------------------|------------------|----------------------|--|
| Combustible Liquid | Combustible Liquid | Flammable material | Flammable Liquid | Pyrophoric material | |
| Explosive material | | Unstable Material | | Water reactive matr. | |
| Oxydiser | | Organic Peroxide | | Corrosive material | |
| Compressed gas | | Irritant | | Sensitizer | |
| Carcinogen | | Mutagen | | Other | |

SAFE USES DATA :

PRECAUTIONS :

| | | | | | |
|-------------------------|-------------|------------------------|-------------------------|---|--|
| Ventilation | | | | | |
| Protective Equipment | Eyes | Goggles / face shields | Handling and Storage | Fuel oil should be stored in well ventilated, properly labeled and approved containers. | |
| | Respiratory | | | | |
| | Gloves | Neoprene, Butyl rubber | Others | | |
| | Clothing | | | | |
| Others | | | | | |

EMERGENCY RESPONSE DATA :

| | |
|-----------------|---|
| Release / Spill | Avoid spillages. Should they occur, sand or earth are useful means of containment and absorption. |
| Waste Disposal | |

ADDITIONAL INFORMATION :

Gastric lavage should be done after endotracheal intubation, in view of risk aspiration which can cause chemical pneumonitis for which antibiotic and corticosteroid therapy may be indicated.

MATERIAL SAFETY DATA SHEET

IDENTITY OF MATERIAL :

Material Name / Identifier : Furnace Oil (FO)

Suppliers Name : Indian Oil Corporation Ltd. (MD)
Budharaja, Sambalpur- 4
Ph.No. 0663 - 2541858
Tele Fax No. 0663 - 2541859/860

| | | | | | |
|----------|-------------------------------------|--------------|------|---------------|---------------|
| Formulla | Complex mixture of hydro carbons | UN No. | 1270 | Label / Class | Not regulated |
| | | CAS No. | | | |
| | | HAZCHEM Code | 3Y*E | | |

PHYSICAL & CHEMICAL PROPERTIES :

| | | | | | |
|------------------------------------|----------------|-----------------------------------|---------------------------------|-----------------------|---------------|
| Physical State | Liquid | Boiling Point / Range, deg. C | 185 - 500 | Vapour Pressure | <1mm Hg. 20 C |
| Appearance | Brown to Black | Melting / Freezing point, deg.C | 29 to 10 (at 38 deg C, mm Hg.) | at 20 deg. C mm Hg. | (approx) |
| Odor | Diesel Fuel | Vapour Density (Air = 1) | 3 to 5 | Evaporation rate | |
| Solubility in water | Insoluble | Specific gravity, 15.5 deg C | 0.9 to 1.05 | at 30 deg. C | |
| Calorific value : (Kcal / Kg.) | 4.34E + 07 | Dyn. Viscosity (PA.S 30 deg. C) | | Heat of vaporisation, | 2.9E + 05 |
| | | Molecular weight : | | Kcal / kg | |
| | | | | Sp. heat liq. J/KG | 1.9 + 03 |

FIRE AND EXPLOSION DATA :

| | | | | | |
|--------------------|---|----------------------------|------------|--------------|-----------------------------|
| Explosivity | | Auto Ignition Temp. deg. C | 263 to 407 | Flash Point | 66 ^o C and above |
| Flammability | Moderate | Explosive Limits, % | 1 to 5 | Burning Rate | 4mm / min |
| Extiguishing Media | Foam, CO ₂ , DCP, Water may be ineffective and cause fire to spread. May be used to cool fire exposed containers. | | | | |
| Spical Procedure | If a leak or spill has not ignited, use water spray to disperse the vapours and to provide for men attempting to stop aleak. Water spray may be used to flush spills away from exposure area. | | | | |
| Unusual Hazards | | | | | |

REACTIVE HAZARDS :

| | | | |
|---|-------------------|------------------------------|-----------------------------------|
| Stability | Stable | Conditions to avoid | Keep away from heat & open flame. |
| Hazardous poly | | Condition to avoid | |
| Incompatibility | Oxidising agents. | | |
| Hazardous Combustion / Decomposition products | | Toxic gases / vapours (CO) | |

HEALTH HAZARDS DATA :

| | | | | | |
|--|--|----------------------------|---------------------|-----------------------|-----|
| Entry Rout | Inhalation / Skin absorption | | | | |
| TLV,PPM, Mg/m ³ | 5 mg/m ³ (Inhalation) | STEL,PPM,Mg/m ³ | 10Mg/m ³ | Odor Threshold PPM | 0.1 |
| PEL,PPM,Mg/m ³ | LD50 oral, Rate g./ kg. | | | LDLo. Human, mg./kg. | |
| Sign / Symptoms of Exposure | Delayed Toxicity | | | | |
| Inhalation | Dizziness, Headache | | | | |
| Ingestion | Nausea, Vomiting. | | | | |
| Contact | Skin irritation,eye contact,Dermatities may result on prolonged contact. | | | | |
| Emergency Treatment (Immediate Medical Attention Required) | | | | | |
| Inhalation | Remove victim to fresh air, give artificial respiration if necessary. If unconscious but breathing place in the unconscious (recovery) position. Give external cardiac massage if necessary. | | | | |
| Ingestion | Do not induce vomiting as it may lead to chemical pneumonitis | | | | |
| Contact | Remove contaminated clothing and wash affected part (Skin / Eyes) with plenty of water, Kerosene / gasoline should never be used. | | | | |

HAZARD SPECIFICATION :

| | | | | | | |
|-------------|-----------|---|-------------|---|-----------------|----|
| NFPA Rating | Health | 0 | Flamability | 2 | Material factor | 10 |
| | Stability | 0 | Special | | | |

KNOWN HAZARDS :

| | | | | | |
|--------------------|--------------------|--------------------|------------------|----------------------|--|
| Combustible Liquid | Combustible Liquid | Flammable material | Flammable Liquid | Pyrophoric material | |
| Explosive material | | Unstable Material | | Water reactive matr. | |
| Oxydiser | | Organic Peroxide | | Corrosive material | |
| Compressed gas | | Irritant | | Sensitizer | |
| Carcinogen | | Mutagen | | Other | |

SAFE USES DATA :

PRECAUTIONS :

| | | | | |
|-------------------------|-------------|------------------------|-------------------------|---|
| Ventilation | | | | |
| Protective Equipment | Eyes | Goggles / face shields | Handling and Storage | Fuel oil should be stored in well ventilated, properly labeled and approved containers. |
| | Respiratory | | | |
| | Gloves | Neoprene, Butyl rubber | | |
| | Clothing | | | |
| | Others | | Others | |

EMERGENCY RESPONSE DATA :

| | |
|-----------------|---|
| Release / Spill | Avoid spillages. Should they occur, sand or earth are useful means of containment and absorption. |
| Waste Disposal | |

ADDITIONAL INFORMATION :

Gastric lavage should be done after endotracheal intubation, in view of risk aspiration which can cause chemical pneumonitis for which antibiotic and corticosteroid therapy may be indicated.

MATERIAL SAFETY DATA SHEET

CHEMICAL IDENTITY

Chemical name: **Diesel Oil**

Chemical Classification: Flammable liquid

Synonyms: Automotive Diesel Oil

Trade name: HSD

Formula Range: C₁₃-C₁₈

C.A.S. NO.68476-30-2

U.N.NO. 1202

Regulated identification

Shipping name: HSD

Codes/Label:

Hazchem Code class3

Hazardous Waste: N.A

Hazardous ingredients

C.A.S.NO.

Hazardous ingredients

C.A.S.No

Diesel

68476-30-2

Benzene Trace

71-43-2

Naphthalene Trace

91-20-3

Sulphur Trace

7704-34-9

Diesel is complex mixture of hydrocarbons. It's exact composition depends on the source of crude oil from which it is produced and refining method used.

PHYSICAL AND CHEMICAL PROPERTIES

Boiling point/Range (deg.C): 215-376. Physical state: Liquid. Appearance: yellowish brown

Melting /freezing point (deg.C): N.A

Vapour pressure: 2.12 to 26mm Hg at 21 deg C.

Odour : Perceptible odour

Vapour density: N.A

Solubility in water @ 30 deg.C: Insoluble

Specific gravity: 0.86-0.90 at 20 deg C

Others: Pour Point: 6-18 deg.C.

FIRE & EXPLOSION HAZARD DATA

Flammability: Yes

LEL: 0.6%

Flash Point (deg C): 30 (OC)

TDG Flammability: class3

UEL: 6%

Flash point (deg C): N.A (CC)

Auto Ignition Temp: 225 deg C

Explosion sensitivity to impact: not sensitive to Mechanical Impact

Explosion sensitivity to static electricity: For vapors sensitivity exist

Hazardous Combustion Products: Carbon Monoxide, Nitrogen Oxide and other aromatic hydrocarbons

Hazardous Polymerization: N.A

Combustible liquid: Yes

Explosive material: Yes

Corrosive material: No

Flammable material: Yes

Oxidiser: N.A

Pyrophoric material: N.A Organic peroxide: N.A

REACTIVITY DATA

Chemical Stability: Stable

Incompatibility with other material: oxidizers such Peroxides, Nitric acid and Perchorates

Hazardous reaction products: on fire it will liberate some amount of carbon monoxide, sulphur dioxide, Nitrogen oxide and other aromatic hydrocarbons.

HEALTH HAZARD DATA

Routes of entry: Inhalation, Skin absorption, ingestion

Effects of Exposure/symptoms: excess inhalation vapors cause rapid breathing, excitability, staggering, headache, fatigue, nausea and vomiting, dizziness, drowsiness, narcosis convulsions, coma.

Skin Contact: Skin –dryness, cracking, irritation eyes watering ,stinging and inflammation

PREVENTIVE MESURES

Personal Protective equipment: Canister type gas mask. PVC or Rubber. Goggles giving complete protection to eyes. Eye wash fountain with safety shower.

Handling and storage precautions: Do not expose to heat and naked lights, keep containers and valves closed when not in use.

EMERGENCY / FIRST-AID MEASURES

Fire

Fire extinguishing media: Foam, Carbon dioxide, Dry Chemical Powder, Water may be used to cool fire-exposed containers.

Special Procedure: Shut off leak, if safe to do so, Keep non-involved people away from spill site. Eliminate all sources of ignition.

Exposure:

Skin Contact: In case of contact with skin, flush with water, remove containment clothing

Inhalation: In case of excessive inhalation, move the victim to fresh air. If problem in breathing, give artificial respiration, give oxygen. Obtain medical assistance.

Ingestion: Give water to conscious victim to drink. Do not induce vomiting.

*Antidotes/Dosages:*N.A

Spills:

Steps to be taken shut off leak, if safe to do so. Keep non-involved people away from spill site. Eliminate sources of ignition. Prevent spill entering into sewers, for major spillage contact Emergency Services.

Waste Disposal Method: N.A

ADDITIONAL INFORMATION

MANUFACTURE/SUPPLIER/CONSUMER DATA

Indian Oil Corporation Limited

Budharaja, Sambalpur-4

Ph.No-0663-2541858

Tele Fax-0663-2541859/860

4.10 Sulphuric Acid:

MATERIAL SAFETY DATA SHEET

MATERIAL IDENTIFICATION

| | | | |
|---|---|-----------------------------|--------------------------|
| Technical Name Sulphuric Acid (98%) | Synonyms Oil of vitriol, fertilizer acid, battery acid, chamber acid | | |
| Chemical Formula H ₂ SO ₄ | Chemical Classification Inorganic Acid | Hazard Class Corrosive-8 | |
| CAS Registry No. No. 7664-93-9 | UN No. 1830 | HazChem Code 2P | Hazardous Waste ID 16 |
| Product Use: Manufacture of chemicals, fertilizers, fibre paints, pigments etc, used in lead/acid batteries as drying agent and laboratory reagent. | | | |

HAZARDOUS INGREDIENTS

| Hazardous Ingredient | Concentration | CAS/UN No | LC 50 | LD 50 |
|----------------------|---------------|-----------|-------|-------|
| Sulphuric Acid | -- | -- | -- | -- |

PHYSICAL AND CHEMICAL PROPERTIES

| | | | |
|-----------------------------|----------------------------------|-------------------------------|-----------------------|
| State Oily liquid | Colour Colourless | Odour Odourless | |
| Molecular weight 98 | Specific gravity 1.84 at 20°C | Water solubility Dilutable | pH 1 |
| Vapour pressure 0.1mm Hg | | Vapour density -- | Freezing Point 3°C |
| Melting Point -- | | Boiling Point 338°C | Others -- |

FIRE /EXPLOSION HAZARD DATA

| | | |
|--|-------------------------|---|
| Flammability Non Flammable | TDG Flammability --- | Flash Point --- |
| Auto Ignition temperature products --- | Explosive range --- | Hazardous Combustion Oxides of Sulphur, H ₂ S |
| Sensitivity to chemical impact Stable | | Sensitivity to static discharge Stable |

REACTIVITY DATA

| | |
|--|--|
| Chemical Stability Stable | Incompatibility Alkalies, water, organic materials, nitrates, carbides, chlorates |
| Reactivity Vigorous reaction with water, reacts violently with Alkalines, combustibles, reducing agents | Dangerous reaction products Hydrogen, toxic fumes of acid |
| Stronger Oxidiser: Explosive reaction with acetic acid , acetone, acetonitrile | |

HEALTH HAZARD DATA

| | | |
|--|-------------------------------|--|
| Route of entry dose | Permissible limits | Lethal |
| Skin Contact, Ingestion, Inhalation =2140Mg/Kg | TLV=5PPM: 7 Mg/M ³ | LD50 (Rat) IDLH=80Mg/M ³ |
| Effects on acute exposure Severe acid burns, fatality corrosive, sore throat Sear, burns, damage to upper respiratory tract, lung edma | | Effects on Chloric exposure Dermatitis, destruction of respiratory tract and lung tissue |
| Sensitization to Material Stable | | Synergistic materials Data not available |

PREVENTIVE MESURES

| | |
|---|---|
| Storage requirement: | Handling Methods |
| Bulk Storage in Mid Steel Tanks Small quantities in Carboys. | Pumping |
| Engineering Controls | Personal protective equipments |
| Dyke wall around storage tanks, Adequate transfer facility from one tanker to another Leak, spill handling | Face shield, Protective Clothing, Hand Gloves and Gum Boot |
| Contain leak preventing enter into drains, water course. Do not use water on large spills, dilute spills by Allowing acid to mix in water. Washings should be neutralized before disposal. | |
| Waste disposal | Special shipping information |
| Dilution and neutralization for disposal | Grades of Purity : Technical 98% Storage Temp : Ambient Inert Atmosphere : Not required Venting : Open |

EMERGENCY / FIRST-AID MEASURES

| | |
|--|-------------------|
| Fire extinguishment | Special procedure |
| Non flammable | --- |
| First Aid | Antidotes |
| Skin: Remove contaminated clothing wash effected area with running water preferably under drench shower | |
| Ingestion: Large intake of water. Do not induce vomiting. | |

ADDITIONAL INFORMATION

First Aid: No neutralizing agent is used on skin. It will aggravate the injury.

MANUFACTURE/SUPPLIER/CONSUMER DATA

| | |
|---|-------------------------------------|
| The Andhra Sugars Limited | Phones: 08813-231597, 231598,231599 |
| Chemicals & Fertilisers Division | Grams : CHEMICALS |
| Kovvur- 534350, A.P/Saggonda-534218 | Fax : 08813-231218 |
| Email: info.kvr@ theandhrasugars.com | |
| Aditya Birla Chemicals (India) Limited | Phones: 06811-254319, 254329 |
| POST-Jayashree, Dist-Ganjam | Fax : 06811-254384 |

MATERIAL SAFETY DATA SHEET

MATERIAL IDENTIFICATION

Product Name: **Petroleum Coke**

Synonym: Petroleum Coke

Chemical Family: Complex hydrocarbon

Formula: Mixture

Petroleum Coke is a solid carbon material produced from high temperature treatment of heavy petroleum fractions. Composition varies depending on source of final product. Polycyclic aromatic hydrocarbons (3-7 ring), such as benzo(a)pyrene, are present in trace concentrations (<0.1%).

HAZARDOUS INGREDIENTS

| Hazardous Ingredient | Weight % | CAS/UN No | LC 50 | LD 50 |
|----------------------|----------|------------|-------|-------|
| Petroleum Coke | 100 | 64741-79-3 | -- | -- |

HAZARD IDENTIFICATION

PETROLEUM COKE IS A CHUNKY, POROUS, BLACK, CARBON MATERIAL. WHEN DECOCKED FROM THE COKE DRUM, IT AND PULVERIZED INTO A FINE BLACK POWDER. IT IS NEITHER A FLAMMABLE NOR COMBUSTIBLE MATERIAL BUT COULD BURN IF HEATED TO EXTREMELY HIGH TEMPERATURES.

Inhalation:

Excessive dust from powdered material (>5 mg/kg) may cause mild respiratory irritation.

Ingestion:

Not likely to be toxic by ingestion.

Skin contact:

None expected from acute exposure.

Eye contact:

Dust may be a mechanical irritant.

FIRST AID MEASURES

Eye Contact:

Flush eyes with large amounts of tepid water for at least 15 minutes. If symptoms or irritation occur, call a physician.

Skin Contact:

Wash with soap and large amounts of water. If symptoms or irritation occur, call a physician.

Ingestion:

Ingestion not likely. If large amounts are swallowed, immediately call a physician.

Inhalation:

If affected, move person to fresh air. If breathing is difficult, administer oxygen. If not breathing or if no heartbeat, give artificial respiration or cardiopulmonary resuscitation (CPR). Immediately call a physician. If symptoms or irritation occur with any exposure, call a physician.

FIRE FIGHTING MEASURES:

Suitable extinguishing media:

For small fires, Class B fire extinguishing media such as CO₂, dry chemical, foam (AFFF/ATC) or water spray can be used. For large fires, water spray, fog or foam (AFFF/ATC) can be used. Fire fighting should be attempted only by those who are adequately trained and equipped with proper protective equipment.

Specific hazards:

This product is neither a flammable nor combustible material, but will burn when heated to extremely high temperature.

Special protective equipment for fire-fighters:

Avoid using straight water streams. Water spray and foam (AFFF/ATC) must be applied carefully to avoid frothing and from as far a distance as possible. Keep surrounding area cool with water spray from a

distance and prevent further ignition of combustible material. Avoid excessive water spray application. Keep run-off water out of sewers and water sources.

Flash point: >200 F

HANDLING & STORAGE

Handling:

Comply with all applicable EPA, OSHA, NFPA and consistent state and local requirements. Use appropriate grounding and bonding practices. Store in properly closed containers that are appropriately labeled and in a cool well-ventilated area. Do not expose to heat, open flames, strong oxidizers or other sources of ignition.

PERSONAL PROTECTION:

PERSONAL PROTECTIVE EQUIPMENT

Engineering measures:

Local or general exhaust required in an enclosed area or when there is inadequate ventilation.

Respiratory protection:

Not required under normal conditions and adequate ventilation. Use dust/ fume respirator if use generates excessive dust/fume or concentrations exceed permissible limits.

Skin and body protection: Gloves.

Eye protection: Dust goggles if use produces excessive dust/fume concentrations.

PHYSICAL & CHEMICAL PROPERTY:

Appearance: Black Porous Chunks or Powder

Substance type (Pure/Mixture): Mixture

Odor: Slight Hydrocarbon

Boiling point/range (5-95%): 7600 F

Specific gravity: 0.8-1.0

Solubility: Negligible

Physical state (Solid/Liquid/Gas): Solid

Color: Black

pH: Neutral

Melting point/range: 6300 F

Vapor pressure: Negligible

VOC content(%): 7 to 12 wt %

STABILITY & REACTIVITY

Stability: The material is stable at 70 F, 760 mm pressure.

Polymerization: Will not occur.

Hazardous decomposition products: Carbon monoxide and carbon dioxide, hydrocarbons.

Materials to avoid: None known.

Conditions to avoid: Dust can form flammable mixtures in air.

TOXOLOGICAL INFORMATION:

Petroleum coke did not affect fertility or reproductive performance in pregnant female rats exposed to up to 300 mg/m³, 6 hours/day for 28 days although some portal-of-entry toxicity (inflammation, discoloured lungs and increased lung weight) was observed. Petroleum coke was found not to be carcinogenic in monkeys and rats in a two-year inhalation study at concentrations up to 30 mg/m³. Chronic inflammatory changes similar to those produced by non-specific respiratory irritants were observed in some rats at the highest exposure level. Chronic skin painting studies of coke dust in mice did not produce evidence of carcinogenicity. Petroleum coke (delayed process and fluid process) was found not to be mutagenic in a rat in vivo bone marrow cytogenetic test, a mouse lymphoma assay and an Ames mutagenicity assay.

ECOTOXICOLOGICAL INFORMATION:

Persistence/Biodegradation:

The 48 and 96 hour LL50s for a water accommodated fraction (WAF) of petroleum coke are >1000 mg/l in both daphnia and fathead minnows, respectively. Coke did not produce any adverse effects on fresh water algae at WAF concentrations of >1000 mg/l. Earthworms and seedlings (corn, radish & soybean) were unaffected by

the presence of concentrations of 1000 mg/kg coke in the soil.

MATERIAL SAFETY DATA SHEET

MATERIAL IDENTIFICATION

Product Name: **Methanol**

Synonym: Wood alcohol, Methanol; Methylol; Wood Spirit; Carbinol

Chemical Formula: CH₃OH

HAZARDOUS INGREDIENTS

| Hazardous Ingredient | Weight % | CAS/UN No |
|----------------------|----------|-----------|
| Methanol | 100 | 67-56-1 |

Toxicological Data on Ingredients: Methyl alcohol: ORAL (LD50): Acute: 5628 mg/kg [Rat]. DERMAL (LD50): Acute: 15800 mg/kg [Rabbit]. VAPOR (LC50): Acute: 64000 ppm 4 hours [Rat].

HAZARD IDENTIFICATION

Potential Acute Health Effects:

Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (permeator). Severe over-exposure can result in death.

Potential Chronic Health Effects:

Slightly hazardous in case of skin contact (sensitizer). CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Classified POSSIBLE for human. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to eyes. The substance may be toxic to blood, kidneys, liver, brain, peripheral nervous system, upper respiratory tract, skin, central nervous system (CNS), optic nerve. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

FIRST AID MEASURES

Eye Contact:

Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Get medical attention.

Skin Contact:

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact:

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Serious Inhalation:

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:

If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Serious Ingestion: Not available.

FIRE FIGHTING MEASURES:

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 464°C (867.2°F)

Flash Points: CLOSED CUP: 12°C (53.6°F). OPEN CUP: 16°C (60.8°F)

Flammable Limits: LOWER: 6% UPPER: 36.5%

Products of Combustion: These products are carbon oxides (CO, CO₂)

Fire Hazards in Presence of Various Substances:

Highly flammable in presence of open flames and sparks, of heat. Non-flammable in presence of shocks.

Explosion Hazards in Presence of Various Substances:

Risks of explosion of the product in presence of mechanical impact: Not available. Explosive in presence of open flames and sparks, of heat.

Fire Fighting Media and Instructions:

Flammable liquid, soluble or dispersed in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog.

Special Remarks on Fire Hazards:

Explosive in the form of vapor when exposed to heat or flame. Vapor may travel considerable distance to source of ignition and flash back. When heated to decomposition, it emits acrid smoke and irritating fumes. CAUTION: MAY BURN WITH NEAR INVISIBLE FLAME

Special Remarks on Explosion Hazards:

Forms an explosive mixture with air due to its low flash point. Explosive when mixed with Chloroform + sodium methoxide and diethyl zinc. It boils violently and explodes

ACCIDENTAL RELEASE MEASURES

Small Spill:

Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

Large Spill:

Flammable liquid. Poisonous liquid. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

HANDLING & STORAGE

Precautions:

Keep locked up.. Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, metals, acids.

Storage:

Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame)

EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls:

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:

Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent Gloves.

Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:

TWA: 200 from OSHA (PEL) [United States] TWA: 200 STEL: 250 (ppm) from ACGIH (TLV) [United States] [1999] STEL: 250 from NIOSH [United States] TWA: 200 STEL: 250 (ppm) from NIOSH SKIN TWA: 200 STEL: 250 (ppm) [Canada] Consult local authorities for acceptable exposure limits.

PHYSICAL & CHEMICAL PROPERTY:

| | |
|---|--|
| Physical state and appearance: Liquid. | Odor: Alcohol like. Pungent when crude. |
| Taste: Not available. | Molecular Weight: 32.04 g/mole |
| Color: Colorless | pH (1% soln/water): Not available. Boiling Point: 64.5°C (148.1°F) |
| Melting Point: -97.8°C (-144°F) | Critical Temperature: 240°C (464°F) |
| Specific Gravity: 0.7915 (Water = 1) | Vapor Pressure: 12.3 kPa (@ 20°C) |
| Vapor Density: 1.11 (Air = 1) | Volatility: Not available |
| Water/Oil Dist. Coeff.: The product is more soluble in water; log(oil/water) = -0.8 | Odor Threshold: 100 ppm |
| Ionicity (in Water): Non-ionic | Dispersion Properties: See solubility in water. |
| Solubility: Easily soluble in cold water, hot water. | |

STABILITY & REACTIVITY

Stability: The product is stable

Instability Temperature: Not available.

Conditions of Instability: Heat, ignition sources, incompatible materials

Incompatibility with various substances: Reactive with oxidizing agents, metals, acids.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:

Can react vigorously with oxidizers. Violent reaction with alkyl aluminum salts, acetyl bromide, chloroform + sodium methoxide, chromic anhydride, cyanuric chloride, lead perchlorate, phosphorous trioxide, nitric acid. Exothermic reaction with sodium hydroxide + chloroform. Incompatible with beryllium dihydride, metals (potassium and magnesium), oxidants (barium perchlorate, bromine, sodium hypochlorite, chlorine, hydrogen peroxide), potassium tert-butoxide, carbon tetrachloride, alkali metals, metals (aluminum, potassium magnesium, zinc), and dichloromethane. Rapid autocatalytic dissolution of aluminum, magnesium or zinc in 9:1 methanol + carbon tetrachloride - sufficiently vigorous to be rated as potentially hazardous. May attack some plastics, rubber, and coatings.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur

ADDITIONAL INFORMATION

Methanol in water is rapidly biodegraded and volatilized. Aquatic hydrolysis, oxidation, photolysis, adsorption to sediment, and bioconcentration are not significant fate processes. The half-life of methanol in surfact water ranges from 24 hrs. to 168 hrs. Based on its vapor pressure, methanol exists almost entirely in the vapor phase in the ambient atmosphere. It is degraded by reaction with photochemically produced hydroxyl radicals and has an estimated half-life of 17.8 days. Methanol is physically removed from air by rain due to its solubility. Methanol can react with NO₂ in polluted to form methyl nitrate. The half-life of methanol in air ranges from 71 hrs. (3 days) to 713 hrs. (29.7 days) based on photooxidation half-life in air.

MANUFACTURE/SUPPLIER/CONSUMER DATA

J.K Paper Mills

At/PO-Jaykaypur, Rayagada , Odisha

Phones: 06856-233770

Fax : 06856-234078

Safety data sheet

Oxygen, refrigerated liquid.

Creation date : 27.01.2005
Revision date : 20.12.2010

Version : 1.3

DE / E

SDS No. : 8341
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1 IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY

Product name

Oxygen, refrigerated liquid.
EC No (from EINECS): 231-956-9
CAS No: 7782-44-7
Index-Nr. 008-001-00-8

Chemical formula O₂

REACH Registration number:

Listed in Annex IV/V of Regulation (EC) No 1907/2006 (REACH), exempted from registration.

Known uses

Not known.

Company identification

Linde AG, Linde Gas Division, Seitnerstraße 70, D-82049 Pullach
E-Mail Address Info@de.linde-gas.com
Emergency phone numbers (24h): 089-7446-0

2 HAZARDS IDENTIFICATION

Classification of the substance or mixture

Classification acc. to Regulation (EC) No 1272/2008/EC (CLP/GHS)

Press. Gas - Contains refrigerated gas; may cause cryogenic burns or injury.

Ox. Gas 1 - May cause or intensify fire; oxidiser.

Classification acc. to Directive 67/548/EEC & 1999/45/EC
O; R8

Contact with combustible material may cause fire.

Risk advice to man and the environment

Refrigerated liquefied gas. Contact with product may cause cold burns or frostbite.

Label Elements

- Labelling Pictograms



- Signal word

Danger

- Hazard Statements

H281 Contains refrigerated gas; may cause cryogenic burns or injury.

H270 May cause or intensify fire; oxidiser.

- Precautionary Statements

Precautionary Statement Prevention

P220 Keep away from combustible materials.
P244 Keep valves and fittings free from oil and grease.
P282 Wear cold insulating gloves/face shield/eye protection.

Precautionary Statement Reaction

P370 + P376 In case of fire: Stop leak if safe to do so.
P336+P315 Thaw frosted parts with lukewarm water.
Do no rub affected area. Get immediate

medical advice/attention.

Precautionary Statement Storage

P403 Store in a well-ventilated place.

Precautionary Statement Disposal

3 COMPOSITION/INFORMATION ON INGREDIENTS

Substance/Preparation: Substance.

Components/Impurities

Oxygen, refrigerated liquid.

CAS No: 7782-44-7

Index-Nr.: 008-001-00-8

EC No (from EINECS): 231-956-9

REACH Registration number:

Listed in Annex IV/V of Regulation (EC) No 1907/2006 (REACH), exempted from registration.

Contains no other components or impurities which will influence the classification of the product.

4 FIRST AID MEASURES

Inhalation

Continuous inhalation of concentrations higher than 75% may cause nausea, dizziness, respiratory difficulty and convulsion. Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

Skin/eye contact

Immediately flush eyes thoroughly with water for at least 15 minutes. In case of frostbite spray with water for at least 15 minutes. Apply a sterile dressing. Obtain medical assistance.

Ingestion

Ingestion is not considered a potential route of exposure.

5 FIRE FIGHTING MEASURES

Specific hazards

Supports combustion. Exposure to fire may cause containers to rupture/explode. Non flammable.

Hazardous combustion products

None.

Suitable extinguishing media

All known extinguishants can be used.

Specific methods

If possible, stop flow of product. Move container away or cool with water from a protected position.

Special protective equipment for fire fighters

None.

6 ACCIDENTAL RELEASE MEASURES

Personal precautions

Evacuate area. Ensure adequate air ventilation. Eliminate ignition sources. Use protective clothing.

Environmental precautions

Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. Try to stop release.

Clean up methods

Ventilate area. Keep area evacuated and free from ignition sources until any spilled liquid has evaporated. (Ground free from frost).

7 HANDLING AND STORAGE

Handling

Safety data sheet

Oxygen, refrigerated liquid.

Creation date : 27.01.2005
Revision date : 20.12.2010

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DE / E

SDS No. : 8341
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Use no oil or grease. Segregate from flammable gases and other flammable materials in store. Suck back of water into the container must be prevented. Do not allow backfeed into the container. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt. Keep away from ignition sources (including static discharges). Refer to supplier's handling instructions.

Storage

Avoid asphalted locations for storage and use (ignition risk if spilt). Keep container below 50°C in a well ventilated place. Observe "Technische Regeln Druckgase (TRG) 280 Ziffer 5"

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Personal protection

Do not smoke while handling product. Avoid oxygen rich (>23%) atmospheres. Ensure adequate ventilation. Protect eyes, face and skin from liquid splashes.

9 PHYSICAL AND CHEMICAL PROPERTIES

General information

Appearance/Colour: Bluish liquid

Odour: None.

Important information on environment, health and safety

Molecular weight: 32 g/mol

Melting point: -219 °C

Boiling point: -183 °C

Critical temperature: -118 °C

Autoignition temperature: Not applicable.

Flammability range: Not applicable.

Relative density, gas: 1,1

Relative density, liquid: 1,1

Solubility mg/l water: 39 mg/l

10 STABILITY AND REACTIVITY

Stability and reactivity

May react violently with combustible materials. May react violently with reducing agents. Violently oxidises organic material. Liquid spillages can cause embrittlement of structural materials. Risk of explosion if spilt on organic structural materials (eg wood or asphalt).

11 TOXICOLOGICAL INFORMATION

General

No known toxicological effects from this product.

12 ECOLOGICAL INFORMATION

General

Can cause frost damage to vegetation.

13 DISPOSAL CONSIDERATIONS

General

Do not discharge into any place where its accumulation could be dangerous. Contact supplier if guidance is required.

EWC Nr. 16 05 04*

14 TRANSPORT INFORMATION

ADR/RID

Class 2 Classification Code 30

UN number and proper shipping name

UN 1073 Oxygen, refrigerated, liquid

UN 1073 Oxygen, refrigerated, liquid

Labels 2.2, 5.1 Hazard number 225

Packing Instruction P203

IMDG

Class 2.2

UN number and proper shipping name

UN 1073 Oxygen, refrigerated, liquid

Labels 2.2, 5.1

Packing Instruction P203

EmS FC, SW

Other transport information

Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Ensure adequate ventilation. Avoid transport on vehicles where the load space is not separated from the driver's compartment. Before transporting product containers ensure that they are firmly secured. Ensure compliance with applicable regulations.

15 REGULATORY INFORMATION

Further national regulations

Regulations for the prevention of industrial accidents

Pressure Vessel Regulation

Technische Regeln für Gefahrstoffe (TRGS)

Gefahrstoffverordnung (GefStoffV)

Water pollution class

Not polluting to waters according to VwVwS from 27.07.2005.

TA-Luft

Not classified according to TA-Luft.

16 OTHER INFORMATION

Ensure all national/local regulations are observed.

Advice

Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted. Details given in this document are believed to be correct at the time of going to press.

Further information

Linde safety advice

No. 1 Handling of refrigerated liquid gases

No. 4 Oxygen enrichment

No. 11 Transport of gas receptacles in vehicles

End of document