MATERIAL SAFETY DATA SHEET

ZINC DI n-BUTYL DITHIO CARBAMATE

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: ZDBC
Company Identification: 237/2, Vellivoyal Chavadi
Chennai – 600 103. Tamilnadu
Office Telephone No: 044 64606747

2. COMPOSITION / INFORMATION OF INGREDIENTS

Chemical description: Zinc Di n-Butyl Dithio Carbamate

<table>
<thead>
<tr>
<th>CHEMICAL NAME</th>
<th>CAS NO.</th>
<th>EINECS NO.</th>
<th>WT%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zinc Di n-Butyl Dithio Carbamate</td>
<td>136-23-2</td>
<td>205-232-8</td>
<td>98</td>
</tr>
</tbody>
</table>

3. HAZARD IDENTIFICATION

Classification of the substance or mixture:

Classification according to EU directives 67/548/EEC or 1999/45/EC REGULATION (EC) No. 1272/2008

Skin sensitization: Cat.1; Skin corrosion/irritation Cat.2; Specific target organ toxicity, single exposure Respiratory tract irritation Cat.3; Hazardous to the aquatic environment, long-term hazard Cat.4

Label elements:

Hazard Statements
H315 : Causes skin irritation.
H317 : May cause an allergic skin reaction.
H335 : May cause respiratory irritation.
H413 : May cause long lasting harmful effects to aquatic life

Precautionary Statements Prevention
P261: Avoid breathing dust/fume/gas/mist/vapours/spray.
P264: Wash face, hands and any exposed skin thoroughly after handling
P271: Use only outdoors or in a well-ventilated area.
P272: Contaminated work clothing should not be allowed out of the workplace.
P273: Avoid release to the environment.
P280: Wear protective gloves / protective clothing / eye protection / face protection

Precautionary Statements Response
P302+P352: IF ON SKIN: Wash with plenty of soap and water.
304+P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P312: Call a POISON CENTER or doctor / physician if you feel unwell.
P321: Specific treatment (see on this label).
P332+P313: If skin irritation occurs: Get medical advice / attention.
P333+P313 IF skin irritation or rash occurs: Get medical advice / attention.
P362: Take off contaminated clothing and wash before reuse.
P363: Wash contaminated clothing before reuse.

Precautionary Statements - storage
P403+P233 - Store in a well-ventilated place. Keep container tightly closed
P405 - Store locked up

Precautionary Statements - Disposal
P501 - Dispose of contents / container to an approved incineration plant

4. FIRST AID MEASURES

General Advice: If symptoms persist, call a physician. Show this material safety data sheet to the Doctor in attendance. Treat symptomatically. Use of alcoholic beverages may enhance toxic effects. In case of allergic reaction after exposure, any future exposure must be avoided.

Inhalation
Remove from exposure, lie down. Move to fresh air. If breathing is difficult, give oxygen. Immediate medical attention is required

Skin Contact:
Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Thoroughly clean shoes before reuse. If skin irritation persists, call a physician

Eye Contact:
Rinse immediately with plenty of water, also under the eye lids, for at least 15 minutes Remove contact lenses Obtain medical attention

Ingestion:
Clean mouth with water and afterwards drink plenty of water. Do not induce vomiting. Treat symptomatically. If swallowed, seek medical advice immediately.

Most important symptoms and effects, both acute and delayed
Causes mild eye irritation. Symptoms may include redness, pain, swelling and tearing
May cause allergic skin reaction. May cause skin de-fattting
with prolonged exposure
May cause irritation of the respiratory tract and alcohol in tolerance

Indication of immediate medical attention and special treatment needed:
General advice for Dithio carbamates. No further relevant information available

5. FIRE FIGHTING MEASURES

Extinguishing Media
Suitable extinguishing media: CO2, powder or water spray. Fight larger fires with Water spray or alcohol resistant foam
Extinguishing media which must not be Used for safety reasons: High volume water jet
Special hazards arising from the substance or mixture:
Specific hazards Heating can release hazardous gases:
Sulphur dioxides (SO2)
Nitrogen oxides (NOx)
Hydrogen cyanide (HCN)
Specific methods Keep product and empty container away from heat and Sources of ignition
Do not flush in to surface water or sanitary sewer system
Prevent product from entering drains
Collect contaminated fire extinguishing water separately.
This must not be discharged in to drains
Protective Equipment and Precautions for Firefighters Wear full protective clothing and self-contained breathing apparatus with full face piece operated in Pressure demand and operated in other positive pressure mode

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures:
Avoid contact with skin, eyes and clothing
Evacuate personnel to safe areas
Keep people away from and up wind of spill / leak
Wear respiratory protection
Wear suitable protective clothing, gloves and eye/face protection
Environmental precautions:
Remove immediately adhering matter
Prevent product from entering drains
Do not flush in to surface water or sanitary sewer system
Inform respective authorities in case of see page in to water
Methods and material for containment and cleaning up:

- Absorb spill with inert material (e.g. dry sand or earth), then place in a chemical waste container
- Do not flush with water
- Avoid dust formation
- Ensure adequate ventilation

7. HANDLING AND STORAGE

Precautions for safe handling:

- Use only in area provided with appropriate exhaust ventilation
- Use spark-proof tool and explosion-proof equipment
- Avoid dust formation
- Avoid contact with skin, eyes and clothing
- Wear personal protective equipment
- Do not breathe vapours / dust
- Do not eat, drink or smoke when using this product
- Wash hands after handling
- Remove contaminated clothing and protective equipment before entering eating areas

Conditions for safe storage, including any incompatibilities & Storage:

- In accordance with local and national regulations
- Keep in a dry, cool place
- Do not store near acids
- Do not store together with oxidizing and self-igniting products
- Use spark-proof tool and explosion-proof equipment
- Keep away from heat, sources of ignition, and direct sunlight

8. EXPOSURE CONTROL / PERSONAL PROTECTION

Control parameters

- Occupational exposure limit values: No data available
- Exposure controls
- Engineering Controls: Avoid dust generation. Ensure good ventilation and local exhaustion of the working area

Personal Protective Equipment:
- Eye/face Protection: Tightly fitting safety goggles or Face shield
- Skin Protection: Wear suitable protective clothing / equipment
- Hand Protection: The glove material has to be impermeable and resistant to the product / the substance / the preparation. Due to missing tests no recommendation to the glove material can be given for the product / the preparation / the chemical
mixture. Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

Respiratory Protection  
In accordance with local and national regulations  
In case of insufficient ventilation, wear suitable respiratory equipment  
Suitable mask with particle filter P3 (EuropeanNorm143)  
self-contained breathing apparatus (EN133)  
(in case of higher concentration)

Environmental exposure controls:  
Prevent product from entering drains  
Do not contaminate surface water  
Avoid sub soil penetration

9. **PHYSICAL AND CHEMICAL PROPERTIES**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance:</td>
<td>Solid powder</td>
</tr>
<tr>
<td>Colour:</td>
<td>White</td>
</tr>
<tr>
<td>Odour:</td>
<td>Characteristic</td>
</tr>
<tr>
<td>pH-value:</td>
<td>Neutral</td>
</tr>
<tr>
<td>Melting point/Melting range:</td>
<td>100–112</td>
</tr>
<tr>
<td>Boiling point/Boiling range:</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Flash point:</td>
<td>No data available</td>
</tr>
<tr>
<td>Explosive properties:</td>
<td>Dust explosion hazard</td>
</tr>
<tr>
<td>Flammability (solid, gas):</td>
<td>No data available</td>
</tr>
<tr>
<td>Explosion Limits:</td>
<td>No data available</td>
</tr>
<tr>
<td>Oxidizing properties:</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapour pressure:</td>
<td>Negligible at room temperature</td>
</tr>
<tr>
<td>Density:</td>
<td>1270 Kg/M3 at 20°C</td>
</tr>
<tr>
<td>Bulk Density:</td>
<td>310–350 Kg/M3</td>
</tr>
<tr>
<td>Solubility in water:</td>
<td>Practically insoluble (0.001g/L at 20°C)</td>
</tr>
<tr>
<td>Solubility in other solvents:</td>
<td>Soluble in Benzene, Acetone &amp; CS2. Partly soluble in Hexane</td>
</tr>
<tr>
<td>Partition coefficient:</td>
<td>Log P=7.04 (Octanol/water)</td>
</tr>
<tr>
<td>Auto-ignition temperature:</td>
<td>400°C</td>
</tr>
<tr>
<td>Relative vapor density:</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity @25°C:</td>
<td>No data available</td>
</tr>
</tbody>
</table>

10. **STABILITY AND REACTIVITY**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reactivity</td>
<td>See Incompatible Materials</td>
</tr>
<tr>
<td>Chemical stability</td>
<td>Stable under recommended storage and handling conditions (See section 7)</td>
</tr>
<tr>
<td>Possibility of hazardous reactions</td>
<td>See Incompatible Materials</td>
</tr>
<tr>
<td>Conditions to avoid</td>
<td>Avoid dust formation</td>
</tr>
</tbody>
</table>
Keep away from heat, sources of ignition, and direct sunlight

Incompatible materials: Strong acids
Oxidizing agents

Hazardous decomposition products: Heating or fire can release toxic gas
 Nitrogen oxides (NOx)
 Sulphur dioxide (SO2)
 Hydrogen cyanide (HCN)

11. TOXICOLOGICAL INFORMATION

Acute toxicity (LD50/oral/rat): >5000mg/Kg
Acute dermal toxicity (LD50/dermal/rabbit): >2000mg/Kg
Acute inhalational toxicity: No data available
Ingestion: Harmful if swallowed. May cause headache, nausea, vomiting, and gastro intestinal irritation
Eye irritation: Irritating to eyes
Skin irritation / sensitization: Irritating to skin, Sensitization possible through Skin contact
Mutagenic Effects: Did not show mutagenic effects in animal experiments
Reproductive toxicity: No toxicity to reproduction
Carcinogenic Effects: Did not show carcinogenic effects in animal experiments
Target Organ Effects: No data available
Human experience: No data available

12. ECOLOGICAL INFORMATION

Component information: Active ingredient
EC50/48h/daphnia magna: 0.074 mg/L
EC50/21d/daphnia magna: 14 ug/L
EC50/96h/algae(Chlorella pyrenoidosa): 1.1 mg/L
EC50/3h/activated sludge(microorganisms): 1428 mg/L
LC50Short-term(toxicitytofish,96-h): >16mg/L (Poeciliareticulata)
NOEC Long-term(toxicitytofish,10-d): 10000 μg/L (Daniorerio)
Mobility in soil: No relevant information is available
Persistence and degradability: No relevant information is available
Bio-accumulative Potential: No relevant information is available
Results of PBT and vPvB assessment: Not applicable

13. DISPOSAL CONSIDERATIONS

Waste Disposal methods
Product: Must not be disposed together with household garbage. Do not allow product to reach sewages system.
Dispense in accordance with local regulations

14. TRANSPORT INFORMATION

Road transport (ADR/RID/ADN)
ADR/RID Class 9
UN-No 3077
Packing Group III
Hazard Label Hazardous for the environment
Proper Shipping Name Environmentally hazardous substance, Solid N.O.S. (Zinc di-n-butyl Dithio carbamate)

Sea transport (IMDG)
ADR/RID Class 9
UN-No 3077
Packing Group III
Marine pollutant Yes
Hazard Label Hazardous for the environment
Proper Shipping Name Environmentally hazardous substance, Solid N.O.S. (Zinc di-n-butyl Dithio carbamate)

Air transport (ICAO-TI/IATA)
ADR/RID Class 9
UN-No 3077
Packing Group III
Proper Shipping Name Environmentally hazardous substance, Solid N.O.S. (Zinc di-n-butyl Dithio carbamate)

15. REGULATORU INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture
Classification according to EU directives 67/548/EEC or 1999/45/EC
Chemical safety assessment: No data available

16. OTHER INFORMATION

Emergency seek Medical Aid