1. NAME OF SUBSTANCE/PREPARATION AND COMPANY

Product details: TETRAETHYL LEAD
Trade name: TDS TEL-CB

Manufacturer details:
TDS Chemical Corp., Ltd.
Office: Hong-Mei Building floor No.4, No. 2008, Hong-Mei Road, Shanghai 200233, China
Plant: No.2 Waisha Industry Zone, Jiaojiang, Taizhou, Zhejiang 318000, China.
Tel: +86-21-6495 5601, 6495 5602, 6495 5603,
Fax: +86-21-6495 5604,
Email: tds@tdschem.com
Website: www.tdschem.com

Emergency telephone number:
Telephone: (+86) 21 6495 5601 (Mon. – Fri. 09.00 am – 18.00 pm)
Telephone: (+86) 186-0177 9000 (outside office hours)

FOR CHEMICAL EMERGENCY DURING TRANSPORTATION
International emergency responses 1.352.323.3500 call INFOTRAC collect. These
numbers are used for leaks, fires and medical emergencies involving human and animals. 24
Hrs. per day, 7 days per week
For domestic within the USA pleas to use 1.800.535.5053.

2. COMPOSITION / DETAILS OF CONSTITUENTS

Chemical characteristics:
Antiknock mixture on the basis of tetraethyl lead and aliphatic halogenated hydrocarbons with
The addition of stabilizer and characteristic colorant.

Hazardous constituents:

<table>
<thead>
<tr>
<th>Mass %</th>
<th>Substance</th>
<th>CAS no.</th>
<th>EEC no.</th>
<th>Index no.</th>
<th>UN no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>61.49 ± 1.00 % mass</td>
<td>Tetraethyl lead Formula: Pb C8 H20</td>
<td>78-00-2</td>
<td>20 10 754</td>
<td>082-002-00-1</td>
<td>1649</td>
</tr>
<tr>
<td>17.86 ± 1.00 % mass</td>
<td>1,2 dibromoethane Formula: Br(CH2)2Br/C2H4Br2</td>
<td>106-93-4</td>
<td>20 34 445</td>
<td>602-010-00-6</td>
<td>1605</td>
</tr>
<tr>
<td>18.81 ± 1.00 % mass</td>
<td>1,2 dichloroethane Formula: C1CH2CH2Cl/C2H4Cl2</td>
<td>107-06-2</td>
<td>20 34 581</td>
<td>602-010-00-7</td>
<td>1184</td>
</tr>
</tbody>
</table>

3. POSSIBLE HAZARDS
Highly toxic if inhaled, swallowed or in contact with skin. May cause cancer.
(continued on page 2)
4. **FIRST AID MEASURES**

**General notes:**
Immediately remove any soiled or soaked clothing and dispose of safely. The affected person should be calmed, laid down and covered warmly. When assisting, the first aider should ensure that he/she is adequately protected. In general, a doctor should be called immediately, and the patient subjected to medical observation for at least 48 hours.

**After inhaling:**
Ensure a supply of fresh air, open any restrictive clothing and administer artificial respiration if necessary.

**After contact with the skin:**
Wash the affected parts of the body thoroughly in petroleum, then rinse with soap and water.

**After contact with the eyes:**
Rinse thoroughly under running water: (open lid wide and remove contact lenses if applicable.)

**After swallowing:**
Rinse mouth immediately and administer plenty of water to drink. Observing the usual precautions (recovery position), induce vomiting if necessary (do not administer milk, vegetable oil, castor oil or alcohol).

**Notes for the doctor:**

- **Latent period:** Ranging from a few hours to 10 days.
- **Possible symptoms:** Slower pulse, nausea, vomiting, headache, confusion, irritability, circulatory collapse, insomnia, hyperactivity, trembling.
- **Treatment:** Monitor circulation, treat for shock if necessary, stomach pump in case of swallowing.

5. **TACKLING FIRES**

**Suitable extinguishers:**

- Large fires: Preferably foam, water spray jet if appropriate.
- Small fires: ABC powder, carbon dioxide.

**Unsuitable extinguishers for safety reasons:**
Full water jet.

**Particular hazards of the substance, its combustion products or gases produced:**

Cf point 3

In the event of fire, release of lead/lead oxide aerosol, hydrogen chloride of hydrogen bromide, organic Decomposition products containing halogen. Do not inhale explosion and fire gases.

**Special safety equipment:**
Respiratory equipment with an independent air supply. Full protective suit.

**Other remarks:**
When extinguishing, care should be taken to ensure that none of the product is washed into the sewerage or water.

Fire residue and contaminated extinguishing water must be disposed of in accordance there is no risk to nearby equipment/buildings or a hazard to human health as a result of fire gases, antiknock mixture fires should be left to burn themselves out as far as possible.

(continued on page 3)
### 6. MEASURES IN THE EVENT OF UNINTENTIONAL RELEASE

**Personal precautions:**
- Avoid contact with the product.
- Use personal safety clothing (see point 8.3).
- Keep all non-essential persons well away.
- Evacuate individuals by directing them down wind of the product.
- Keep away from possible sources of ignition.

**Environmental measures:**
- Prevent from spreading (e.g. by damming, using chemical binders).
- Prevent contamination of water and soil.
- Do not allow product to enter the sewerage system.

**Cleaning/collection procedure:**
- Collect using a fluid-binding material (chemicals or oil binders) and dispose of in accordance with the local regulations (special waste).
- Chemically detoxify any minor quantities of residue using 5% potassium permanganate solution or diluted chlorine bleaching solution (1 part to 3 parts water).
- Detoxification agents are oxidation agents and must never be used dry or undiluted, or mixed together with other detoxification agents.

### 7. HANDLING AND STORAGE

**Handling:**

**Instructions on safe handling:**
- Only handle and refill the product in a closed system.
- Pump with the aid of vacuum.
- Waste air must only be expelled via suitable absorbers.

**Instructions on fire and explosion prevention:**
- Vapors may form an explosive mixture with air.
- Avoid naked flames, direct heat and sparks.
- Take measures to prevent electrostatic charging.

**Storage:**

**Requirements for storage rooms and containers:**
- Keep containers securely sealed and in a well-ventilated area.
- Use containers made of steel or stainless steel.
- A floor tank without a drain is required.

**Notes on mixed storage:**
- Do not store together with oxidation agents.

**Other details of storage conditions:**
- Store under nitrogen or protective fluid (ethylene glycol).

**Recommended storage temperature:**
- -10°C to 30°C

**Storage category:**
- 6.1 A

(continued on page 4)
8. EXPOSURE LIMITATION AND PERSONAL SAFETY EQUIPMENT

Workplace limits (in accordance with the Technical Regulations for Hazardous Substances (FRG))

<table>
<thead>
<tr>
<th>CAS no.</th>
<th>Description of substance</th>
<th>Type</th>
<th>Value Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>78-02-2</td>
<td>Tetraethyl lead</td>
<td>Max. workplace</td>
<td>0.01 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>concentration</td>
<td>0.075 mg pb/m³</td>
</tr>
<tr>
<td>106-93-4</td>
<td>1,2 dibromoethane</td>
<td>Tech. guideline</td>
<td>0.01 ml/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>concentration</td>
<td>0.8 mg/m³</td>
</tr>
<tr>
<td>107-06-2</td>
<td>1,2 dichloroethane</td>
<td>Tech. guideline</td>
<td>5 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>concentration</td>
<td>20 mg/m³</td>
</tr>
</tbody>
</table>

Personal safety equipment:

Respiratory protection:
For concentrations < 1% volume, breathing mask with gas filter A3. (gas filter category A1 must not be used).
For concentrations > 1% volume, respiratory equipment with an independent air.
Supply; observe time limits of wear as stipulated by national law.

Protection of the hands:
Gloves (oil and solvent-resistant) made of neoprene or nitride rubber.

Eye protection:
Preferably cage-style goggles or safety goggles with side protection.

Body protection:
Chemical protection suit (e.g. coated butyl rubber).

9. PHYSICAL AND CHEMICAL PROPERTIES

Form: Liquid
Color: Yellow or orange
Odor: Sweetish, mouldy, unpleasant.

Data relevant to safety:

Change of state
Freezing point / melting point ≤ -39 °C
Boiling point approx 180 °C for tetraethyl lead
(spontaneous decomposition)
132 °C for 1,2 dibromoethane
83 °C for 1,2 dichloroethane

Flash point
80 °C for tetraethyl lead
13 °C for 1,2 dichloroethane

Ignition temperature
136 °C for tetraethyl lead
515 °C for 1,2 dibromoethane
440 °C for 1,2 dichloroethane

Explosion limits
LEL 1.8 % vol. for tetraethyl lead
UEL 25 % vol. for tetraethyl lead
LEL 6.2% for 1,2 dichloroethane
UEL 16.0% for 1,2 dichloroethane

(continued on page 5)
Trade name: TDS TEL-CB

Vapors pressure at 70 mbar (20°C) Water = 1.58～1.62 g/cm³
Specific Gravity / Density ≤ 1.8 mPas (20°C)
Viscosity 3 mg for tetraethyl lead
Water solubility (20°C) 4.3 g/1 for 1,2 dibromoethane
Distribution coefficient (log P_{ow}) 8.7 g/1 for 1,2 dichloroethane

Kinematics viscosity 20°C at cp 20°C 0.83
Explosive limits, Vol% in air 1.8
Vapor Pressure 20 deg. °C (mm Hg) 36.
Specific gravity correction (per deg °C) 0.0015
Specific heat capacity j/kg deg °C 0.96
Coefficient of expansion (per deg °C) 0.00098
PB 39.00

Other details:
The vapour is heavier than air

10. STABILITY AND REACTIVITY

Thermal decomposition / conditions to be avoided:
Spontaneous decomposition begins at temperatures ≥ 110 °C
From 180 °C explosive decomposition is possible.
Avoid storage temperatures ≥ 40 °C

Substances to be avoided:
Contact with oxidation agents.

Hazardous products of decomposition:
Lead oxide fumes or aerosol, hydrogen chloride or hydrogen bromide.

Other details:
Product is stabilized via the addition of 0.60 % mass DTBP and 0.18 % mass CMMS.

11. GENERAL DETAILS OF TOXICOLOGY

Acute toxicity:

<table>
<thead>
<tr>
<th>Substance</th>
<th>Parameter</th>
<th>Type</th>
<th>Value</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetraethyl lead</td>
<td>LD 50</td>
<td>oral</td>
<td>12.3 mg/kg</td>
<td>Rat</td>
</tr>
<tr>
<td></td>
<td>LD 50</td>
<td>par</td>
<td>15 mg/kg</td>
<td>Rat</td>
</tr>
<tr>
<td></td>
<td>LC 50</td>
<td>inhal</td>
<td>850 mg/m³ (1h)</td>
<td>Rat</td>
</tr>
<tr>
<td>1,2 dibromoethane</td>
<td>LD 50</td>
<td>oral</td>
<td>108 mg/kg</td>
<td>Rat</td>
</tr>
<tr>
<td></td>
<td>LD 50</td>
<td>dermal</td>
<td>300 mg/kg</td>
<td>Rabbit</td>
</tr>
<tr>
<td></td>
<td>LC 50</td>
<td>inhal</td>
<td>689 ppm (1h)</td>
<td>Rat</td>
</tr>
<tr>
<td>1,2 dichloroethane</td>
<td>LD 50</td>
<td>oral</td>
<td>670 mg/kg</td>
<td>Rat</td>
</tr>
<tr>
<td></td>
<td>LC 50</td>
<td>inhal</td>
<td>4.1 mg/l (1h)</td>
<td>Rat</td>
</tr>
</tbody>
</table>

(continued on page 6)
Trade name: TDS TEL-CB

Primary irritant effect:
No data is available for tetraethyl lead, but in view of the strong toxic effect of the product via resorption, the possible irritant effect is only of secondary importance. 1,2 dibromoethane and 1,2 dichloroethane can be described as extreme irritants to the skin, eyes and respiratory organs, in both liquid and vapour form.

Observed effect on humans:
Intoxication may lead to insomnia, weight loss and psychological symptoms (nightmares, euphoria).

12. DETAILS OF ECOLOGY

Elimination data (persistence and degradability):
Degradability:
Tetraethyl lead in vapour form is unstable and decomposes relatively quickly particularly under the influence of (UV) light (half-life 2 – 8 hours).

Mobility and bio-accumulation potential:
Heavier than water, sinks to the ground.
Is adsorbed by the soil and is not mobile.
Bio-accumulation is possible, particularly in the form of inorganic lead (reversible).

General notes:
Water hazard category 3; highly hazardous to water.

13. DISPOSAL INSTRUCTIONS

Disposal of residue / waste disposal:
Return to TDS for recycling within the context of service agreements.
Pass to an authorized waste disposal company.

Disposal of containers:
Empty containers completely.
Chemically detoxify the residue / wall adhesions.
Do not perforate, cut or weld any containers which have not been cleaned.

Other instructions:
TDS performs cleaning of antiknock mixture storage tanks within the context of service agreements.

14. TRANSPORT DATA

Land transportation ADR/RID:
Category 6.1 toxic substances
Number(letter) 31a
Hazard no. (kemler no.) 66
Substance no. (UN no.) 1649
Hazard label 6.1
Packaging group 1
Description of substance Tetraethyl lead, ethyl fluid.

Sea freight IMDG:
Category 6.1 toxic substances
Packaging group 1
UN number 1649
Safety Data Sheet
In accordance with 91/155/EEC

Trade name: TDS TEL-CB

<table>
<thead>
<tr>
<th>EMS no.</th>
<th>6.1-0.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>MFAG</td>
<td>111</td>
</tr>
<tr>
<td>Marine pollutant</td>
<td>P (marking)</td>
</tr>
<tr>
<td>Label</td>
<td>6.1</td>
</tr>
</tbody>
</table>

**Air freight ICAO/IATA;**

<table>
<thead>
<tr>
<th>Category</th>
<th>6.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN/ID no.</td>
<td>1649</td>
</tr>
<tr>
<td>Packaging group</td>
<td>1</td>
</tr>
<tr>
<td>Proper shipping name</td>
<td>Antiknock Fuel Additive.</td>
</tr>
<tr>
<td>Remarks</td>
<td>Air craft cargo only.</td>
</tr>
</tbody>
</table>

15. **REGULATIONS**

**Labeling in accordance with EEC guidelines:**
The product is classified in accordance with EC guidelines / hazardous substances ordinance, and must be labeled.

- **Indicating letter:** T+
- **Description:** Highly toxic
- **Contans:** Mixed lead alkyls, 1,2 dibromoethane,

- **Risk categories:** 6.1
  - May damage unborn babies
  - 45
  - May cause cancer
  - 26-27-28
  - Highly toxic when inhaled, swallowed and in contact with the skin.
  - 33
  - Risk of cumulative effects.

- **Safety categories:** 53
  - Avoid exposure, obtain special instructions before use.
  - 45
  - Consult a doctor immediately in case of accidents or illness.

**National regulations for tetraethyl lead:**
To be completed by the importer in accordance with the valid regulations.

(continued on page 8)
16. OTHER INFORMATION

This data is based on our current level of knowledge but does not constitute an assurance of product properties and does not justify a contractual legal relationship. And the information above is believed to be accurate and represents the best information currently available to TDS Chemical Corp., Ltd. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall the company be of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if the company has been advised of the possibility of such damages.

The product is only for commercial processing / use.

Further information: Manufacturer details:
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