SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier
Trade name Dimethylcarbamyl chloride
Stock number: L03415
CAS Number: 79-44-7
EC number: 201-208-6
Index number: 006-041-00-0

1.2 Relevant identified uses of the substance or mixture and uses advised against.
Identified use: SU24 Scientific research and development

1.3 Details of the supplier of the safety data sheet
Manufacturer/Supplier:
Thermo Fisher (Kandel) GmbH
Zeppelinstr. 7b
76185 Karlsruhe / Germany
Tel: +49 (0) 721 84007 280
Fax: +49 (0) 721 84007 300
Email: tech@alfa.com
www.alfa.com
Informing department: Product safety Tel + +049 (0) 7275 988687-0

1.4 Emergency telephone number:
Carechem 24: +44 (o) 1235 239 670 (Multi-language emergency number)
Poison Information Center Mainz
www.giftinfo.uni-mainz.de Telephone: +49(0)6131/19240

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture
Classified according to Regulation (EC) No 1272/2008
- GHS06 skull and crossbones
- Acute Tox. 3 H331 Toxic if inhaled.
- GHS08 health hazard
- Carc. 1B H350 May cause cancer.
- GHS07
- Acute Tox. 4 H302 Harmful if swallowed.
- Skin Irrit. 2 H315 Causes skin irritation.
- Eye Irrit. 2 H319 Causes serious eye irritation.
- STOT SE 3 H335 May cause respiratory irritation.

Classification according to Directive 67/548/EEC or Directive 1999/45/EC
- T; Toxic
- Carc. Cat. 2
- R45-23: May cause cancer. Toxic by inhalation.
- Xn; Harmful
- R22: Harmful if swallowed.
- Xi; Irritant
- R36/37/38: Irritating to eyes, respiratory system and skin.

Information concerning particular hazards for human and environment: Not applicable
Other hazards that do not result in classification No information known.

2.2 Label elements
Labelling according to Regulation (EC) No 1272/2008 The substance is classified and labelled according to the CLP regulation.

Hazard pictograms
- GHS06
- GHS08

Signal word Danger
Hazard statements
H302 Harmful if swallowed.
H331 Toxic if inhaled.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H350 May cause cancer.
H335 May cause respiratory irritation.

Precautionary statements
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P281 Use personal protective equipment as required.
P305+P351+P338 IF IN EYES; Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P405 Store locked up.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

2.3 Other hazards
Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.

SECTION 3: Composition/information on ingredients

3.1 Substances
CAS# Designation: 79-44-7 Dimethylcarbamyl chloride

(Contd. on page 2)
SECTION 4: First aid measures

4.1 Description of first aid measures

General information

Instantly remove any clothing soiled by the product.
Remove breathing apparatus only after soiled clothing has been completely removed.
In case of irregular breathing or respiratory arrest provide artificial respiration.

After inhalation

Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.
Seek immediate medical advice.

After skin contact

Instantly wash with water and soap and rinse thoroughly.
Seek immediate medical advice.

After eye contact

Rinse opened eye for several minutes under running water. Then consult doctor.

After swallowing

Seek medical treatment.

4.2 Most important symptoms and effects, both acute and delayed

No further relevant information available.

4.3 Indication of any immediate medical attention and special treatment needed

No further relevant information available.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing agents: CO2, sand, extinguishing powder. Do not use water.

5.2 Special hazards arising from the substance or mixture

If this product is involved in a fire, the following can be released:

- Carbon monoxide and carbon dioxide
- Nitrogen oxides (NOx)
- Hydrogen chloride (HCl)

5.3 Advice for firefighters

Protective equipment:

Wear self-contained breathing apparatus.

Wear full protective suit.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation

6.2 Environmental precautions

Do not allow material to be released to the environment without proper governmental permits.

6.3 Methods and material for containment and cleaning up

Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose of contaminated material as waste according to section 13.
Ensure adequate ventilation.

Prevention of secondary hazards

Keep away from ignition sources.

6.4 Reference to other sections

See Section 7 for information on safe handling
See section 8 for information on personal protection equipment.
See Section 13 for information on disposal.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Handle under dry protective gas.
Keep containers tightly sealed.
Store in cool, dry place in tightly closed containers.
Ensure good ventilation/exhaustion at the workplace.
Open and handle container with care.

Information about protection against explosions and fires:
Keep ignition sources away - Do not smoke.

7.2 Conditions for safe storage, including any incompatibilities

Storage
Requirements to be met by storerooms and containers:
No special requirements.

Information about storage in one common storage facility:
No special requirements.

Further information about storage conditions:
Store under dry inert gas.
This product is moisture sensitive.
Keep container tightly sealed.
Store in cool, dry conditions in well sealed containers.
Protect from humidity and keep away from water.

7.3 Specific end use(s)

No further relevant information available.

SECTION 8: Exposure controls/personal protection

Additional information about design of technical systems:
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

8.1 Control parameters

Components with critical values that require monitoring at the workplace:

- 79-44-7 Dimethylcarbamyl chloride (100.0%) REA (USA) See Pocket Guide App. A
- TLV (USA) Long-term value: 0.02 mg/m³, 0.005 ppm

Additional information:
No data

8.2 Exposure controls

Personal protective equipment

General protective and hygienic measures
The usual precautionary measures should be adhered to in handling the chemicals.

Keep away from foodstuffs, beverages and food.
Instantly remove any soiled and imregnated garments.
Wash hands during breaks and at the end of the work.

Store protective clothing separately.
Avoid contact with the eyes and skin.

Maintain an ergonomically appropriate working environment.

Breathing equipment:
Use self-contained respiratory protective device in emergency situations.
Protection of hands:
Check protective gloves prior to each use for their proper condition.
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

Material of gloves: Impervious gloves
Penetration time of glove material (in minutes) Not determined

Eye protection:
Safety glasses
Face protection: Probably carboxylated

Body protection: Protective work clothing.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

General Information

Appearance: Liquid
Colour: Colourless to pale yellow
Smell: Unpleasant
Odour threshold: Not determined.

pH-value: Not determined.

Change in condition
Melting point/Melting range: -33 °C
Boiling point/Boiling range: 167-168 °C
Sublimation temperature / start: Not determined

Flash point: 68 °C
Inflammability (solid, gaseous) Not applicable.
Ignition temperature: Not determined
Decomposition temperature: Not determined
Self-inflammability: Not determined.

Danger of explosion: Not determined.

Critical values for explosion:
Lower: 4.8 Vol %
Upper: 19.2 Vol %
Steam pressure at 20 °C: 3.6 hPa
Density at 20 °C: 1.171 g/cm³
Relative density Not determined.
Vapour density Not determined.
Evaporation rate Not determined.
Solubility in / Miscibility with Water: Reacts
Partition coefficient (n-octanol/water): Not determined.

Viscosity
dynamic: Not determined.
kinematic: Not determined.

9.2 Other information
No further relevant information available.

SECTION 10: Stability and reactivity

10.1 Reactivity
No information known.

10.2 Chemical stability
Stable under recommended storage conditions.

Thermal decomposition / conditions to be avoided: No decomposition if used and stored according to specifications.

10.3 Possibility of hazardous reactions
No dangerous reactions known

10.4 Conditions to avoid
No further relevant information available.

10.5 Incompatible materials:

- Oxidising agents
- Bases
- Water/moisture

10.6 Hazardous decomposition products:
Carbon monoxide and carbon dioxide
Nitrogen oxides (NOx)

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity:
Harmful if swallowed.
Toxic if inhaled.
The Registry of Toxic Effects of Chemical Substances (RTECS) contains acute toxicity data for components in this product.

LD/LC50 values that are relevant for classification:

| Oral LD50 | 1000 mg/kg (rat) |
| Inhalative LC50/6H | 180 ppm/6H (rat) |

Skin irritation or corrosion:
Corrosive effect on skin and mucous membranes.
Causes skin irritation.

Eye irritation or corrosion:
Strong corrosive effect.
Causes serious eye irritation.

Sensitization: No sensitizing effect known.

Germ cell mutagenicity: The Registry of Toxic Effects of Chemical Substances (RTECS) contains mutation data for this substance.

Carcinogenicity:
May cause cancer.

NTD-8: Reasonably anticipated to be a carcinogen: limited evidence from studies in humans or sufficient evidence from studies in experimental animals.
IARC-3A: Probably carcinogenic to humans: limited human evidence; sufficient evidence in experimental animals.

ACGIH A2: Suspected human carcinogen: Agent is carcinogenic in experimental animals at dose levels, by route(s) of administration, at site(s), of histologic type(s), or by mechanism(s) considered relevant to worker exposure. Available epidemiologic studies are conflicting or insufficient to confirm an increased risk of cancer in exposed humans.

The Registry of Toxic Effects of Chemical Substances (RTECS) contains tumorigenic and/or carcinogenic and/or neoplastic data for this substance.

Reproductive toxicity: No effects known.

Specific target organ system toxicity - repeated exposure: No effects known.
Specific target organ system toxicity - single exposure: May cause respiratory irritation.

Aspiration hazard: No effects known.
Subacute to chronic toxicity: No effects known.

Additional toxicological information: To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.

(Contd. on page 4)
SECTION 12: Ecological information

12.1 Toxicity
Aquatic toxicity: No further relevant information available.

12.2 Persistence and degradability
No further relevant information available.

12.3 Bioaccumulative potential
No further relevant information available.

Additional ecological information:

General notes:
Do not allow product to reach ground water, water bodies or sewage system.
Do not allow material to be released to the environment without proper governmental permits.
Water danger class 3 (Self-assessment); extremely hazardous for water.
Do not allow product to reach ground water, water bodies or sewage system, even in small quantities.
Danger to drinking water if even extremely small quantities leak into soil.
Avoid transfer into the environment.

12.5 Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.

12.6 Other adverse effects
No further relevant information available.

SECTION 13: Disposal considerations

13.1 Waste treatment methods
Recommendation
Hand over to disposers of hazardous waste.
Must be specially treated under adherence to official regulations.
Consult state, local or national regulations for proper disposal.
Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.

SECTION 14: Transport information

UN-Number
ADR, IMDG, IATA UN2262

14.2 UN proper shipping name
ADR
IMDG, IATA DIMETHYL CARBAMOYL CHLORIDE

14.3 Transport hazard class(es)
ADR

Class
8 (C3) Corrosive substances.

IMDG, IATA

Class
8 Corrosive substances.

Packing group
ADR, IMDG, IATA II

14.5 Environmental hazards:
Not applicable.

14.6 Special precautions for user
Warning: Corrosive substances.
Kemler Number:
80
EMS Number:
F-A-S-B Acids

14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code
Not applicable.

Transport/Additional information:

ADR

Excepted quantities (EQ):
E2
Limited quantities (LQ) 1 L
Transport category 2
Tunnel restriction code E

UN “Model Regulation”:
UN2262, DIMETHYL CARBAMOYL CHLORIDE, 8, II

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
Australian Inventory of Chemical Substances Substance is listed.
Standard for the Uniform Scheduling of Drugs and Poisons Substance is not listed.

National regulations
Information about limitation of use: Workers should not be exposed to this hazardous material. Exceptions can be made by the authorities in certain exceptional cases. Employment restrictions concerning young persons must be observed. For use only by technically qualified individuals.
Classification according to VbF: Not applicable
Technical instructions (air):

Class
Share in %
1 100.0

Water hazard class: Water danger class 3 (Self-assessment); extremely hazardous for water.

Other regulations, limitations and prohibitive regulations
ELINCS (European List of Notified Chemical Substances) Substance is not listed.
Substance of Very High Concern (SVHC) according to the REACH Regulations (EC) No 1907/2006. Substance is not listed.
The conditions of restrictions according to Article 67 and Annex XVII of the Regulation (EC) No 1907/2006 (REACH) for the manufacturing, placing on the market and use must be observed.
Substance is not listed.
Annex XIV of the REACH Regulations (requiring Authorisation for use) Substance is not listed.

15.2 Chemical safety assessment: A Chemical Safety Assessment has not been carried out.
SECTION 16: Other information

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

Department issuing SDS: Global Marketing Department

Abbreviations and acronyms:
- RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
- ICAO: International Civil Aviation Organization
- ADR: Accident Européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
- IMDG: International Maritime Code for Dangerous Goods
- IATA: International Air Transport Association
- GHS: Globally Harmonized System of Classification and Labelling of Chemicals
- EINECS: European Inventory of Existing Commercial Chemical Substances
- CAS: Chemical Abstracts Service (division of the American Chemical Society)
- VbF: Verordnung über brennbare Flüssigkeiten, Österreich (Ordinance on the storage of combustible liquids, Austria)
- LC50: Lethal concentration, 50 percent
- LD50: Lethal dose, 50 percent
- vPvB: very Persistent and very Bioaccumulative
- ACGIH: American Conference of Governmental Industrial Hygienists (USA)
- NIOSH: National Institute for Occupational Safety and Health (USA)
- NTP: National Toxicology Program (USA)
- IARC: International Agency for Research on Cancer
- EPA: Environmental Protection Agency (USA)