

KPX Fine Chemical Co., Ltd.

Material Safety Data Sheet(MSDS)

KFC-32-001E

KPX Fine Chemical Safety data sheet according to Regulation (EC) No. 1272/2008

Date / Revised : 05.10.2011

Version : 6.0

Product : KONNATE T-80

1. Identification of the substance/mixture and of the company/undertaking

Product identifier

KONNATE T-80

Chemical name : TDI

Relevant identified uses of the substance or mixture and uses advised against

Recommended use: polyurethane component, industrial chemicals

For the detailed identified uses of the product see appendix of the safety data sheet.

Details of the supplier of the safety data sheet

Company : KPX Fine Chemical Co., Ltd.

Head Office / Plant : 425 Walha-Dong, Yeosu-City, Chunnam, South Korea

TEL : +82-61-685-5161

FAX : +82-61-688-4919

E-mail address : lwk@kpxfinechem.com

Seoul Office : KPX Building., 473 Gongdeok-Dong, Mapo-gu, Seoul, Korea(121-805)

TEL : +82-2-2014-4281

FAX : +82-2-364-8397

E-mail address : kimjs@kpxfinechem.com

Emergency telephone number

Telephone : +82 2 2014 4250

2. Hazards Identification

Label elements

According to Regulation (EC) No 1272/2008 [CLP]

Pictogram :



Signal Word :

Danger

Hazard Statement :

H351 Suspected of causing cancer.

H330 Fatal if inhaled.

H319 Causes serious eye irritation.

H335 May cause respiratory irritation.

H315 Causes skin irritation.

H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.

H317 May cause an allergic skin reaction.

H412 Harmful to aquatic life with long lasting effects.

Precautionary Statements (Prevention):

P273 Avoid release to the environment.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P284 Wear respiratory protection.

Precautionary Statements (Response):

P308 + P313 IF exposed or concerned: Get medical advice/attention.

Precautionary Statements (Storage) :

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

Precautionary Statements (Disposal):

P501 Dispose of contents/container to hazardous or special waste collection point.

Labeling of special preparations (GHS) :

Contains isocyanates. See information supplied by the manufacturer.

According to Directive 67/548/EEC or 1999/45/EC

Council Directive 67/548/EEC of 27 June 1967 on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances

Hazard symbol(s)

T+ Very toxic.

R-phrase(s)

R26 Very toxic by inhalation.

R36/37/38 Irritating to eyes, respiratory system and skin.

R42/43 May cause sensitization by inhalation and skin contact.

R52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

R40 Limited evidence of a carcinogenic effect.

S-phrase(s)

S23.5 Do not breathe vapour.

S36/37 Wear suitable protective clothing and gloves.

S45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S61 Avoid release to the environment. Refer to special instructions/safety data sheets.

Contains isocyanates. Observe manufacturer's instructions.

Hazard determining component(s) for labelling : TOLYLIDENEDIISOCYANATE

Classification of the substance or mixture

According to Regulation (EC) No 1272/2008 [CLP]

Acute toxicity : Cat. 1 (Inhalation - vapour)

Carcinogenicity : Cat. 2

Serious eye damage/eye irritation : Cat. 2

Skin corrosion/irritation : Cat. 2

Specific target organ toxicity following single exposure : Cat. 3 (irritating to respiratory system)

Respiratory sensitizer : Cat. 1

Skin sensitizer : Cat. 1

Chronic hazards to the aquatic environment: Cat. 3

According to Directive 67/548/EEC or 1999/45/EC

Carc. Cat. 3 – Category 3 : Substances which cause concern for man due to possible carcinogenic effects, however, since sufficient information is not available a satisfactory assessment cannot be made.

Possible Hazards :

Very toxic by inhalation.

Irritating to eyes, respiratory system and skin.

May cause sensitization by inhalation and skin contact.

Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Limited evidence of a carcinogenic effect.

3. Composition/Information on Ingredients

Substances

Chemical nature

TOLYLIDENEDIISOCYANATE (Content (W/W) : 100 %)

CAS Number: 26471-62-5

EC-Number: 247-722-4

INDEX-Number: 615-006-00-4

REACH pre-registration has been completed.

4. First-Aid Measures

Description of first aid measures

Immediately remove contaminated clothing.

If inhaled :

Keep patient calm, remove to fresh air, seek medical attention.

On skin contact :

After contact with skin, wash immediately with plenty of water. Consult a doctor if skin irritation persists.

On contact with eyes :

Immediately wash affected eyes for at least 15 minutes under running water with eyelids held open, consult an eye specialist.

On ingestion :

Immediately rinse mouth and then drink plenty of water, do not induce vomiting, seek medical attention.

Most important symptoms and effects, both acute and delayed

Hazards: Symptoms can appear later.

Indication of any immediate medical attention and special treatment needed

Treatment : Treat according to symptoms (decontamination, vital functions), no known specific antidote, administer corticosteroid dose aerosol to prevent pulmonary edema.

5. Fire-Fighting Measures

Extinguishing media

Suitable extinguishing media:

dry powder, carbon dioxide, alcohol-resistant foam, water spray

Special hazards arising from the substance or mixture

carbon monoxide, carbon dioxide, hydrogen cyanide, nitrogen oxides, isocyanate
The substances/groups of substances mentioned can be released in case of fire.

Advice for fire-fighters

Special protective equipment :

Wear self-contained breathing apparatus and chemical-protective clothing.

Further information :

Keep containers cool by spraying with water if exposed to fire. Dispose of fire debris and contaminated extinguishing water in accordance with official regulations.

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures

Use personal protective clothing. Use breathing apparatus if exposed to vapours/dust/aerosol. Ensure adequate ventilation.

Environmental precautions

Do not empty into drains. Do not discharge into the subsoil/soil.

Methods and material for containment and cleaning up

For large amounts: Pump off product.

For residues: Pick up with suitable absorbent material. Dispose of absorbed material in accordance with regulations.

Neutralize with a solution of 5 - 10 % Sodium carbonate, 0,2 - 2 % detergents and 90 - 95 % water.

Reference to other sections

Information regarding exposure controls/personal protection and disposal considerations can be found in section 8 and 13.

7. Handling and Storage

Precautions for safe handling

Provide suitable exhaust ventilation at the processing machines. Ensure thorough ventilation of stores and work areas. Avoid aerosol formation. When handling heated product, vapours of the product should be ventilated, and respiratory protection used. Wear respiratory protection when spraying.

Danger of bursting when sealed gastight. Protect against moisture. Products freshly manufactured from isocyanates can contain incompletely reacted isocyanates and other dangerous substances.

Conditions for safe storage, including any incompatibilities

Keep away from water. Segregate from foods and animal feeds. Segregate from acids and bases.

Suitable materials for containers: carbon steel (iron), High density polyethylene (HDPE), Low density polyethylene (LDPE), tin (tinplate), Stainless steel 1.4301 (V2)

Unsuitable materials for containers: paper, board

Further information on storage conditions: Keep container tightly closed in a cool, well-ventilated place. Protect against moisture. Formation of CO₂ and build up of pressure possible. Danger of bursting when sealed gastight.

Storage stability :

Protect against moisture.

If moisture enters isocyanate containers, CO₂ forms and pressure builds up.

Specific end use(s)

For the relevant identified use(s) listed in Section 1 the advice mentioned in this section 7 is to be observed.

8. Exposure Controls/Personal Protection**Control parameters**Components with workplace control parameters

91-08-7 : 2-methyl-m-phenylene diisocyanate

584-84-9 : 4-methyl-m-phenylene diisocyanate

PNEC

freshwater : 0.0125 mg/l

marine water : 0.00125 mg/l

intermittent release : 0.125 mg/l

STP : 1 mg/l

DNEL

worker

Short-term exposure – systemic effects, Inhalation: 0.14 mg/m³

worker

Short-term exposure – local effects, Inhalation: 0.14 mg/m³

worker

Long-term exposure – systemic effects, Inhalation: 0.035 mg/m³

worker

Long-term exposure – local effects, Inhalation: 0.035 mg/m³

Exposure controlsPersonal protective equipment

Respiratory protection :

Respiratory protection in case of vapour/aerosol release. Gas filter for gases/vapours of organic compounds (boiling point >65 °C, e. g. EN 14387 Type A) Particle filter with high efficiency for solid and liquid particles (e.g. EN 143 or 149, Type P3 or FFP3).

Suitable respiratory protection for higher concentrations or long-term effect :
Self-contained breathing apparatus.

Hand protection :

Chemical resistant protective gloves (EN 374)

Suitable materials also with prolonged, direct contact (Recommended: Protective index 6, corresponding > 480 minutes of permeation time according to EN 374):

nitrile rubber (NBR) – 0.4 mm coating thickness

butyl rubber (butyl) – 0.7 mm coating thickness

chloroprene rubber (CR) – 0.5 mm coating thickness

Unsuitable materials

polyvinylchloride (PVC) – 0.7 mm coating thickness

Polyethylene-Laminate (PE laminate) – ca. 0.1 mm coating thickness

Eye protection:

Safety glasses with side-shields (frame goggles) (e.g. EN 166)

Body protection:

safety shoes (e.g. according to EN 20346)

General safety and hygiene measures

Do not breathe vapour/spray. With products freshly manufactured from isocyanates body protection and chemical resistant protective gloves is recommended. Wearing of closed work clothing is required additionally to the stated personal protection equipment. Keep away from food, drink and animal feeding stuffs. No eating, drinking, smoking or tobacco use at the place of work. Take off immediately all contaminated clothing. Hands and/or face should be washed before breaks and at the end of the shift. At the end of the shift the skin should be cleaned and skin-care agents applied.

9. Physical and Chemical Properties

Information on basic physical and chemical properties

Form : liquid

Colour : colourless to yellowish

Odour : characteristic, pungent

Odour threshold : 0.05 – 2.14 ppm

pH value : not applicable
Melting point : 11.5 – 13.5 °C
Boiling point : approx. 251 °C
Flash point : approx. 135 °C
Flammability : not applicable
Lower explosion limit : 0.9 %(V) (118 °C)
Upper explosion limit : 9.5 %(V) (150 °C)
Ignition temperature : > 600 °C
Vapour pressure : 0.03mmHg (25 °C)
Density: 1.22 g/cm³ (25 °C) (DIN 51757)
Relative density : 1.22 (25 °C)
Solubility in water: Hydrolyzes to form water-insoluble compounds.
Partitioning coefficient n-octanol/water (log K_{ow}) : not applicable
Thermal decomposition : 230 °C
Viscosity, dynamic: 3 – 6 mPa.s (25 °C)

Other information

Molecular weight : 174.2
Molecular Formular : C₉H₆N₂O₂

10. Stability and Reactivity

Reactivity

Corrosion to metals : No corrosive effect on metal.

Chemical stability

The product is stable if stored and handled as prescribed/indicated.

Possibility of hazardous reactions

Conditions to avoid

Temperature: < 15 °C

Avoid moisture.

Incompatible materials

Substances to avoid :

copper, zinc, tin, acids, alcohols, amines, water, Alkalines, copper alloys, aluminum

compounds, strong oxidizing agents

Hazardous decomposition products

No hazardous decomposition products if stored and handled as prescribed/indicated.

11. Toxicological Information

Information on toxicological effects

Acute toxicity

Assessment of acute toxicity :

Of very high toxicity after short-term inhalation. Of low toxicity after single ingestion.
Virtually nontoxic after a single skin contact.

Experimental/calculated data :

LD50 rat (oral): 4,130 mg/kg (OECD Guideline 401)

LC50 rat (by inhalation) : 0.48 mg/l 1 h (OECD Guideline 403)

The vapour was tested.

LD50 rabbit (dermal) : > 9,400 mg/kg (OECD Guideline 402)

Irritation

Assessment of irritating effects :

Irritating to eyes, respiratory system and skin.

Experimental/calculated data :

Skin corrosion/irritation rabbit: Irritant.

Serious eye damage/irritation rabbit : Irritant. (Draize test)

Respiratory/Skin sensitization

Assessment of sensitization :

The substance may cause sensitization of the respiratory tract. Sensitization after skin contact possible. Studies in animals suggest that dermal exposure may lead to pulmonary sensitization.

However, the relevance of this result for humans is unclear.

Experimental/calculated data :

Mouse Local Lymph Node Assay (LLNA) mouse: skin sensitizing (OECD Guideline 429)

Germ cell mutagenicity

Assessment of mutagenicity :

The substance was mutagenic in various test systems with bacterias and cell cultures;

however, these results could not be confirmed in tests with mammals.

Carcinogenicity

Assessment of carcinogenicity :

Indication of possible carcinogenic effect in animal tests. A clear indication of an increased risk of cancer in humans has so far not been shown. In long-term studies, a carcinogenic effect was observed when the substance was given orally to laboratory animals(gavage). Not carcinogenic in laboratory animals after long-term inhalation exposures.

Reproductive toxicity

Assessment of reproduction toxicity :

The results of animal studies gave no indication of a fertility impairing effect.

Developmental toxicity

Assessment of teratogenicity :

No indications of a developmental toxic / teratogenic effect were seen in animal studies.

Specific target organ toxicity (single exposure)

Assessment of STOT single:

Causes temporary irritation of the respiratory tract.

Repeated dose toxicity and Specific target organ toxicity (repeated exposure)

Assessment of repeated dose toxicity:

The substance may cause damage to the lung even after repeated inhalation of low doses, as shown in animal studies. The substance may cause damage to the upper respiratory tract even after repeated inhalation, as shown in animal studies.

Aspiration hazard

No aspiration hazard expected.

12. Ecological Information

Toxicity

Assessment of aquatic toxicity :

Acutely harmful for aquatic organisms. The inhibition of the degradation activity of activated sludge is not anticipated when introduced to biological treatment plants in appropriate low concentrations.

The product may hydrolyse. The test result maybe partially due to degradation products.

Toxicity to fish :

LC50 (96 h) 133 mg/l, *Oncorhynchus mykiss* (OECD Guideline 203, static)

Aquatic invertebrates :

EC50 (48 h) 12.5 mg/l, *Daphnia magna* (OECD Guideline 202, part 1, static)

The details of the toxic effect relate to the nominal concentration.

Aquatic plants :

EC50 (96 h) 3,230 mg/l (growth rate), *Skeletonema costatum* (OECD Guideline 201, static)

The details of the toxic effect relate to the nominal concentration.

(96 h) 4,300 mg/l (growth rate), *Chlorella vulgaris* (OECD Guideline 201, static)

The details of the toxic effect relate to the nominal concentration.

Microorganisms/Effect on activated sludge :

EC50 (3 h) > 100 mg/l, activated sludge (OECD Guideline 209, aquatic)

Chronic toxicity to aquatic invertebrates :

No observed effect concentration (21 d), 1.1 mg/l, *Daphnia magna* (OECD Guideline 211, static)

The details of the toxic effect relate to the nominal concentration.

Soil living organisms :

LC50 (14 d) > 1,000 mg/kg, *Eisenia foetida* (OECD Guideline 207, artificial soil)

Terrestrial plants :

No observed effect concentration (14 d), *Avena sativa* (OECD Guideline 208)

No observed effect concentration (14 d), *Lactuca sativa* (OECD Guideline 208)

Persistence and degradability

Assessment biodegradation and elimination (H₂O) :

Poorly biodegradable. Not readily biodegradable (by OECD criteria). The product is unstable in water.

The elimination data also refer to products of hydrolysis.

Elimination information :

0 % BOD of the ThOD (28 d) (OECD Guideline 302 C) (aerobic, activated sludge, domestic, non-adapted) Poorly biodegradable.

Assessment of stability in water :

In contact with water the substance will hydrolyse rapidly.

Bioaccumulative potential

Assessment bioaccumulation potential :

Accumulation in organisms is not to be expected.

The product has not been tested. The statement has been derived from the properties of the hydrolysis products.

Mobility in soil (and other compartments if available)

Assessment transport between environmental compartments :

Due to the product characteristics the test is impossible.

Other adverse effects

The substance is not listed in Annex I of Regulation (EC) 2037/2000 on substances that deplete the ozone layer.

Additional information

Adsorbable organically-bound halogen (AOX) :

This product contains no organically-bound halogen.

Other ecotoxicological advice :

Do not release untreated into natural waters. Do not allow to enter soil, waterways or waste water channels.

13. Disposal Considerations

Waste treatment methods

Incinerate in suitable incineration plant, observing local authority regulations.
Dispose of isocyanate waste in dry containers and never mix together with other wastes (reaction, dangerous pressure build up).

Waste key :

07 02 08 other still bottoms and reaction residues

Contaminated packaging :

Contaminated packaging should be emptied as far as possible; then it can be passed on for recycling after being thoroughly cleaned.

14. Transport Information

Land transport

ADR

Hazard class : 6.1

Packing group : II

ID number : UN 2078

Hazard label : 6.1

Proper shipping name : TOLUENE DIISOCYANATE

RID

Hazard class : 6.1

Packing group : II

ID number : UN 2078

Hazard label : 6.1

Proper shipping name : TOLUENE DIISOCYANATE

Inland waterway transport

ADNR

Hazard class : 6.1

Packing group : II

ID number : UN 2078

Hazard label : 6.1

Proper shipping name : TOLUENE DIISOCYANATE

Sea transport

IMDG

Hazard class : 6.1

Packing group : II

ID number : UN 2078

Hazard label : 6.1

Marine pollutant : NO

Proper shipping name : TOLUENE DIISOCYANATE

Air transport

IATA/ICAO

Hazard class : 6.1

Packing group : II

ID number : UN 2078

Hazard label : 6.1

Proper shipping name : TOLUENE DIISOCYANATE

15. Regulatory Information

Safety, health and environmental regulations/legislation specific for the substance or mixture

Industrial Safety and Health Act

Ordinance on Prevention of Hazards due to Specified Chemical- : Tolylene diisocyanate
Substances (appended table 3 of article 2 of Order) (Category II)

Labeling substances : Tolylene diisocyanate
(Article 57-1 of Act, appended table 2 of article 30 of Ordinance)

Notifiable substances : Tolylene Diisocyanate
(Article 57-2 of Act, appended table 9 of article 18 of Order)

Mutagenicity substances : 2,6-Tolylene diisocyanate
(guideline and notification substances)

Labor Standards Act

Illness chemical substances

(items 4-1 in appended table 1-2 of Ordinance 35)

(Public notice of the Ministry of Health and Welfare No. 36 of March 30, 1978)

: Tolylene diisocyanate

Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof (PRTR Law)

Class I Designated Chemical Substances

: Tolylene diisocyanate

(Effective from October 1, 2009)

(Cabinet Order No. 1-298)

Fire and Disaster Management Act (Fire Service Law)

Dangerous Substances

: Class 4-3

Ship Safety Act

: Class 6.1

Aviation Law

: Class 6.1

Act Relating to the Prevention of Marine Pollution and Maritime Disaster

Harmful liquid Substances

: Category Y

(appended table 1 of Order)

Air Pollution Control Act

Substances of Hazardous Air Pollutant

: Tolylene diisocyanate

16. Other Information

Vertical lines in the left hand margin indicate an amendment from the previous version.

The data contained in this safety data sheet are based on our current knowledge and experience and describe the product only with regard to safety requirements. The data do not describe the product's properties (product specification). Neither should any agreed property nor the suitability of the product for any specific purpose be deduced from the data contained in the safety data sheet. It is the responsibility of the recipient of the produce to ensure any proprietary rights and existing laws and regulation are observed.