1. Identification of the substance/mixture and of the company/undertaking
   Product identifier:
   Product name: 2,2',2"-Nitrilotriethanol
   Product code (SDS NO): 8012E-3
   Details of the supplier of the safety data sheet
   Manufacturer/Supplier: KISHIDA CHEMICAL CO., LTD.
   Address: 3-1, Honmachibashi, Chuo-ku, Osaka 540-0029, JAPAN
   Division: Safety Management Dept. of Chemicals
   Telephone number: +81-6-6946-8061
   FAX: +81-6-6946-1607
   e-mail address: kagakuhinanzenkanri@kishida.co.jp

2. Hazards identification
   GHS classification and label elements of the product
   Classification of the substance or mixture
   HEALTH HAZARDS
   - Skin corrosion/irritation: Category 2
   - Serious eye damage/eye irritation: Category 2
   - Skin sensitization: Category 1
   - Carcinogenicity: Category 2
   - Specific target organ toxicity - single exposure: Category 2 (Liver)
   - Specific target organ toxicity - single exposure: Category 3 (Respiratory tract irritation)
   - Specific target organ toxicity - repeated exposure: Category 2 (Respiratory tract)
   Label elements

   Signal word: Warning
   HAZARD STATEMENT
   - Causes skin irritation
   - Causes serious eye irritation
   - May cause an allergic skin reaction
   - Suspected of causing cancer
   - May cause damage to organs after single exposure
   - May cause respiratory irritation
   - May cause damage to organs through prolonged or repeated exposure

   PRECAUTIONARY STATEMENT
   Prevention
   - Do not breathe dust/fume/gas/mist/vapors/spray.
   - Use only outdoors or in a well-ventilated area.
   - Wash contaminated parts thoroughly after handling.
   - Wear protective gloves.
   - Contaminated work clothing should not be allowed out of the workplace.
   - Wear eye protection/face protection.
   - Do not eat, drink or smoke when using this product.
   Response
   - Get medical advice/attention if you feel unwell.
3. Composition/information on ingredients
Mixture/Substance selection:
Substance
Ingredient name: 2,2',2"-Nitrilotriethanol
Content(%): 97(min)
Chemical formula: C₆H₁₅NO₃
Chemicals No, Japan: 2-308
CAS No.: 102-71-6
MW: 130.1864
ECNO: 203-049-8
Note: The figures shown above are not the specifications of the product.
Impurities and stabilizing additives
2,2'-Iminodiethanol: ≦1.0% (CAS No. 111-42-2)

4. First-aid measures
Descriptions of first-aid measures
General measures
Get medical attention/advice if you feel unwell.
IF INHALED
Remove person to fresh air and keep comfortable for breathing.
Call a POISON CENTER or doctor/physician if you feel unwell.
IF ON SKIN (or hair)
Take off immediately all contaminated clothing. Rinse skin with water/shower.
Wash with plenty of soap and water.
If skin irritation or rash occurs: Get medical advice/attention.
IF IN EYES
Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If eye irritation persists: Get medical advice/attention.
IF SWALLOWED
Rinse mouth.
Call a POISON CENTER or doctor/physician if you feel unwell.

5. Fire-fighting measures
Extinguishing media
Suitable extinguishing media
Use appropriate extinguishing media suitable for surrounding facilities.
Specific hazards arising from the substance or mixture
Containers may explode when heated.
Fire may produce irritating, corrosive and/or toxic gases.

Advice for firefighters
Specific fire-fighting measures
Evacuate non-essential personnel to safe area.
Special protective equipment and precautions for fire-fighters
Wear fire/flame resistant/retardant clothing.
Wear protective gloves/protective clothing/eye protection/face protection.
Firefighters should wear self-contained breathing apparatus with full face piece operated positive pressure mode.

6. Accidental release measures
Personnel precautions, protective equipment and emergency procedures
Ventilate area until material pick up is complete.
Wear proper protective equipment.
Methods and materials for containment and cleaning up
Absorb spill with inert material (dry sand, earth, et al), then place in a chemical waste container.
Preventive measures for secondary accident
Collect spillage.

7. Handling and storage
Precautions for safe handling
Preventive measures
(Exposure Control for handling personnel)
Do not breathe dust/fume/gas/mist/vapors/spray.
(Protective measures against fire and explosion)
Keep away from heat/sparks/open flames/hot surfaces. − No smoking.
Exhaust/ventilator
Exhaust/ventilator should be available.
Safety treatments
Avoid contact with skin.
Avoid contact with eyes.
Safety Measures/Incompatibility
Use only outdoors or in a well-ventilated area.
Wear protective gloves, protective clothing or face protection.
Wear eye protection/face protection.
When using do not eat, drink or smoke.
Conditions for safe storage, including any incompatibilities
Recommendation for storage
Keep container tightly closed.
Store in a cool, dry place. Do not store in direct sunlight.

8. Exposure controls/personal protection
Control parameters
Adopted value
(2,2',2"—Nitrilotriethanol)
ACGIH(1990) TWA: 5mg/m3 (Eye & skin irr)
(2,2’—Iminodiethanol)
ACGIH(2008) TWA: 1mg/m3(IFV) (Liver & kidney dam)
Notation
(2,2’—Iminodiethanol)
Skin
Exposure controls
Appropriate engineering controls
Do not use in areas without adequate ventilation.
Eye wash station should be available.
Washing facilities should be available.
Individual protection measures
Respiratory protection
Wear respiratory protection.
Hand protection
Wear protective gloves.
Eye protection
Wear eye/face protection.
Safety and Health measures
Wash … thoroughly after handling.
Do not eat, drink or smoke when using this product.
Contaminated work clothing should not be allowed out of the workplace.
Take off contaminated clothing and wash it before reuse.

9. Physical and Chemical Properties
Information on basic physical and chemical properties
Physical properties
Appearance: Liquid
Color: Colorless, clear to pale yellow
Odor: Characteristic odor
pH data N.A.
Phase change temperature
Initial Boiling Point/Boiling point: 335.4°C
Boiling range data N.A.
Melting point/Freezing point: 21.6°C
Decomposition temperature data N.A.
Flash point: (C.C.)(2,2’,2”-Nitrilotriethanol)(C.C.) 179°C
Auto-ignition temperature: 324°C
Explosive properties: Flammability or explosive limit
Lower limit: 3.6 vol %
Upper limit: 7.2 vol %
Vapor pressure: < 1Pa (25 C)
Relative Vapor Density (Air=1): 5.1
Relative density of the Vapor/air-mixture at 20°C (Air = 1): 1
Specific gravity/Density: 1.1
Solubility
Solubility in water: Soluble
n-Octanol /water partition coefficient: log Pow=2.3

10. Stability and Reactivity
Reactivity
N.A.
Chemical stability
Stable under normal storage/handling conditions.
Possibility of hazardous reactions
(2,2’,2”-Nitrilotriethanol)
The substance is a weak base. Reacts with oxidants. Decomposes on burning. This produces
2,2',2"-Nitrilotriethanol, KISHIDA CHEMICAL CO., LTD., 8012E-3, 14/02/2019

Toxic and corrosive fumes including nitrogen oxides. (ICSC 1034)

(2,2'-Iminodiethanol)

Decomposes on burning. This produces toxic fumes. The solution in water is a medium strong base. Reacts violently with strong oxidants and strong acids. Attacks copper, zinc, aluminium and their alloys. (ICSC 0618)

Conditions to avoid
- Contact with incompatible materials.
- Contact with fire source.

Incompatible materials
- Strong acids, Oxidizing agents

Hazardous decomposition products
- Nitrogen oxides

11. Toxicological Information

Information on toxicological effects

Acute toxicity

Acute toxicity (Oral)
- [GHS Cat. Japan, base data]
- (2,2'-Iminodiethanol)
  rat LD50=2300mg/kg (SIDS, 2008)

Irritant properties

Skin corrosion/irritation
- [GHS Cat. Japan, base data]
- (2,2',2"-Nitrilotriethanol)
  human irritation (NTP TR 518, 2004 et al)
  rabbit moderate irritation (SIDS, 2008)

Serious eye damage /irritation
- [GHS Cat. Japan, base data]
- (2,2',2"-Nitrilotriethanol)
  rabbit recover within 14 days (PATTY 6th, 2012 et al)
  rabbit severe irritation (SIDS, 2008)

Sensitization

Skin sensitization
- [GHS Cat. Japan, base data]
- (2,2',2"-Nitrilotriethanol)
  cat. 1; ACGIH 7th, 2001

No Mutagenic effects data available

Carcinogenicity
- [GHS Cat. Japan, base data]
- (2,2'-Iminodiethanol)
  cat.2; IARC Gr. 2B (IARC, 2011)
  IARC-Gr.3 : Not Classifiable as a Human Carcinogen
- (2,2',2"-Nitrilotriethanol)
  IARC-Gr.2B : Possibly carcinogenic to humans
  IARC-Gr.2B : Confirmed Animal Carcinogen with Unknown Relevance to Humans
  cat.2; NTP TER 96001, 1999

Reproductive toxicity
- [GHS Cat. Japan, base data]
- (2,2'-Iminodiethanol)
  cat. 2; NTP TER 96001, 1999
No Teratogenic effects data available
Delayed and immediate effects and also chronic effects from short- and long-term exposure

**STOT**
- Single exposure
  - [cat.1]
    - [GHS Cat. Japan, base data]
    - (2,2'-Iminodiethanol)
    - Liver (SIDS, 2008)
  - [cat.2]
    - [GHS Cat. Japan, base data]
    - (2,2'-Iminodiethanol)
    - Kidney; respiratory apparatus/system (SIDS, 2008)
  - [cat.3 (resp. irrit.)]
    - [GHS Cat. Japan, base data]
    - (2,2',2'''-Nitrilotriethanol)
    - Respiratory tract irritation (NTP TR 518, 2004)

**STOT** - repeated exposure
- [cat.1]
  - [GHS Cat. Japan, base data]
  - (2,2'-Iminodiethanol)
  - Respiratory tract (SIDS, 2008)
- [cat.2]
  - [GHS Cat. Japan, base data]
  - (2,2'-Iminodiethanol)
  - Blood; kidney; liver (SIDS, 2008)

No Aspiration hazard data available

### 12. Ecological Information

#### Ecotoxicity

**Aquatic toxicity**
- Aquatic acute toxicity component(s) data
  - [GHS Cat. Japan, base data]
  - (2,2',2'''-Nitrilotriethanol)
  - Algae (Scenedesmus subspicatus) EC50=169mg/L/96hr (SIDS, 2001)
  - (2,2'-Iminodiethanol)
  - Crustacea (Daphnia) LC50=2.15mg/L/48hr (Aquire, 2012)

**Aquatic chronic toxicity component(s) data**
- [GHS Cat. Japan, base data]
- (2,2',2'''-Nitrilotriethanol)
- Crustacea (Daphnia magna) NOEC=16mg/L/21days (SIDS, 2001)

**Water solubility**
- (2,2',2'''-Nitrilotriethanol)
  - miscible in water (HSDB, 2013)
- (2,2'-Iminodiethanol)
  - very good (ICSC, 2002)

**Persistence and degradability**
- (2,2',2'''-Nitrilotriethanol)
  - Not degrade rapidly (BOD_Degradation : 0% (Registered chemicals data check & review 1978))
- (2,2'-Iminodiethanol)
  - TOC_Degradation : 96.7% (Registered chemicals data check & review)

**Bioaccumulative potential**
- (2,2',2'''-Nitrilotriethanol)
  - log Pow=−2.3 (ICSC, 2003)
13. Disposal considerations
   Waste treatment methods
   Dispose of contents/container in accordance with local/national regulation.

14. Transport Information
   Not applicable to UN No.
   IMDG Code (International Maritime Dangerous Goods Regulations)
   Not applicable to IMDG Code
   IATA Dangerous Goods Regulations
   Not applicable to IATA Dangerous Goods Regulations
   Environmental hazards
   MARPOL Annex III – Prevention of pollution by harmful substances
   Marine pollutants (yes/no): no
   Transport in bulk according to Annex II of MARPOL73/78 and IBC Code
   Noxious Liquid: Cat. Y
   2,2′-Iminodiethanol
   Noxious Liquid: Cat. Z
   2,2',2″-Nitrilotriethanol

15. Regulatory Information
   Safety, health and environmental regulations/legislation specific for the substance or mixture
   US major regulations
   TSCA
   2,2′,2″-Nitrilotriethanol; 2,2′-Iminodiethanol
   Other regulatory information
   Ensure this material in compliance with federal requirements and ensure conformity to local regulations.

16. Other information
   GHS classification and labelling
   Skin Irrit. 2: H315 Causes skin irritation
   Eye Irrit. 2: H319 Causes serious eye irritation
   Skin Sens. 1: H317 May cause an allergic skin reaction
   Carc. 2: H351 Suspected of causing cancer
   STOT SE 2: H371 May cause damage to organs after single exposure
   STOT SE 3: H335 May cause respiratory irritation
   STOT RE 2: H373 May cause damage to organs through prolonged or repeated exposure
   Reference Book
   Globally Harmonized System of classification and labelling of chemicals, (5th ed., 2013), UN
   Recommendations on the TRANSPORT OF DANGEROUS GOODS 20th edit., 2017 UN
   Classification, labelling and packaging of substances and mixtures (table3–1 ECNO6182012)
   2016 EMERGENCY RESPONSE GUIDEBOOK (US DOT)
   2018 TLVs and BEIs. (ACGIH)
   http://monographs.iarc.fr/ENG/Classification/index.php
   Supplier’s data/information
General Disclaimer

This information contained in this data sheet represents the best information currently available to us. However, no warranty is made with respect to its completeness and we assume no liability resulting from its use. It is advised to make their own tests to determinate the safety and suitability of each such product or combination for their own purposes.

The data given here is based on current knowledge and experience. The purpose of this Safety Data Sheet is to describe the products in terms of their safety requirements. The data does not signify any warranty with regard to the products’ properties.

The GHS classification data given here is based on current Japan official data (NITE published in 2017).