REAGENTS DUKSAN

SAFETY DATA SHEET

According to OSHA Hazcom Standard 29 CFR 1910.1200

O-Tolidine Solution

Date of issue: 2019-03-12 **Revision date: 2026-02-10** **Version: R0003.0001**

1. IDENTIFICATION

A. Product name

- O-Tolidine Solution

B. Recommended use and restriction on use

- General use : for experimental, research and industrial use
- Restriction on use : Never drink, Not used except for experimental, research and industrial applications.

C. Manufacturer / Supplier / Distributor information

○ **Manufacturer information**

- Company name : DUKSAN PURE CHEMICALS
- Address : 53,SINWONRO 133BEONGIL, DANWONGU, ANSANSHI, GYUNGGIDO, KOREA
- Emergency telephone number : 82-31-495-4055

○ **Supplier/Distributer information**

- Company name : DUKSAN PURE CHEMICALS
- Address : 53,SINWONRO 133BEONGIL, DANWONGU, ANSANSHI, GYUNGGIDO, KOREA
- Telephone number : 82-31-495-4055
- Emergency telephone number : 82-31-495-4055
- Fax number : 82-31-495-4058

2. HAZARD IDENTIFICATION

A. GHS Classification

- Acute toxicity (oral) : Category4
- Skin corrosion/irritation : Category2
- Serious eye damage/irritation : Category1
- Carcinogenicity : Category1B

B. GHS label elements

○ **Hazard symbols**



○ **Signal words**

- Danger

○ **Hazard statements**

- H302 Harmful if swallowed
- H315 Causes skin irritation
- H318 Causes serious eye damage
- H350 May cause cancer

○ **Precautionary statements**

1) Prevention

- P201 Obtain special instructions before use.
- P202 Do not handle until all safety precautions have been read and understood.
- P264 Wash hands thoroughly after handling.

- P270 Do not eat, drink or smoke when using this product.
- P280 Wear protective gloves/protective clothing/eye protection/face protection.

2) Response

- P301+P312 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
- P302+P352 IF ON SKIN: Wash with plenty of soap and water.
- P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P308+P313 If exposed or concerned: Get medical advice/attention.
- P310 Immediately call a POISON CENTER or doctor/physician.
- P321 Specific treatment
- P330 Rinse mouth.
- P332+P313 If skin irritation occurs: Get medical advice/attention.
- P362 Take off contaminated clothing and wash before reuse.

3) Storage

- P405 Store locked up.

4) Disposal

- P501 Dispose of contents/container in accordance with local/regional/national/international regulation

C. Other hazards which do not result in classification : (NFPA Classification)

○ **NFPA grade (0 ~ 4 level)**

- Health : 3, Flammability : 0, Reactivity : 1

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	Trade names and Synonyms	CAS No.	Content(%)
Water	-	7732-18-5	95.9
Hydrogen chloride	-	7647-01-0	4
3,3'-Dimethylbenzidine	-	119-93-7	0.1

4. FIRST AID MEASURES

A. Eye contact

- Do not rub your eyes.
- Immediately flush eyes with plenty of water for at least 15 minutes and call a doctor/physician.
- Get medical attention immediately.
- Remove contact lenses if worn.

B. Skin contact

- Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.
- Wash contaminated clothing thoroughly before re-using.
- Get medical attention immediately.
- Go to the hospital immediately if symptoms(flare, irritate) occur.
- Remove contaminated clothing, shoes and isolate.
- Wash thoroughly after handling.
- Wear gloves when washing the patient, and please avoid contact with contaminated clothing.

C. Inhalation contact

- When exposed to large amounts of steam and mist, move to fresh air.
- Take specific treatment if needed.
- Get medical attention immediately.
- If breathing is stopped or irregular, give artificial respiration and supply oxygen.

D. Ingestion contact

- Please be advised by doctor whether induction of vomit is demanded or not.
- Rinse your mouth with water immediately.
- Get medical attention immediately.

E. Delayed and immediate effects and also chronic effects from short and long term exposure

- Not available

F. Notes to physician

- Notify medical personnel of contaminated situations and have them take appropriate protective measures.
- If exposed or concerned, get medical attention/advice.

5. FIREFIGHTING MEASURES

A. Suitable (Unsuitable) extinguishing media

- Dry chemical, carbon dioxide, regular foam extinguishing agent, spray
- Avoid use of water jet for extinguishing

B. Specific hazards arising from the chemical

- Not available

C. Special protective actions for firefighters

- Cool containers with water until well after fire is out.
- Keep unauthorized personnel out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- Notify your local firestation and inform the location of the fire and characteristics hazard.
- Wear appropriate protective equipment.
- Keep containers cool with water spray.
- Vapor or gas is burned at distant ignition sources can be spread quickly.

6. ACCIDENTAL RELEASE MEASURES

A. Personal precautions, protective equipment and emergency procedures

- Wear proper personal protective apparatus as indicated in Section 8 and avoid skin contact and inhalation.
- Do not touch spilled material. Stop leak if you can do it without risk.
- Move container to safe area from the leak area.
- Remove all sources of ignition.
- Do not direct water at spill or source of leak.
- Avoid skin contact and inhalation.
- Cleanup and disposal under expert supervision is advised.
- Keep unauthorized people away,isolate hazard area and deny entry.

B. Environmental precautions

- Prevent runoff and contact with waterways, drains or sewers.
- If large amounts have been spilled, inform the relevant authorities.

C. Methods and materials for containment and cleaning up

- Large spill : Stay upwind and keep out of low areas. Dike for later disposal.
- Notification to central government, local government. When emissions at least of the standard amount
- Dispose of waste in accordance with local regulation.
- Appropriate container for disposal of spilled material collected.
- Small leak: sand or other non-combustible material, please let use absorption.
- Wipe off the solvent.
- Dike for later disposal.
- Spilled material should be treated as a potential risk of waste collected.

7. HANDLING AND STORAGE

A. Precautions for safe handling

- Refer to Engineering controls and personal protective equipment.
- Dealing only with a well-ventilated place.
- Do not handle until all safety precautions have been read and understood.

- Do not inhale the steam prolonged or repeated.
- Contaminated work clothing should not be allowed out of the workplace.

B. Conditions for safe storage, including any incompatibilities

- Save in cool, dry and well ventilated place.
- Do not use damaged containers.
- Do not apply direct heat.
- No open fire.
- By specifying a storage area for carcinogenic substances.
- Collected them in sealed containers.
- Do not eat, drink or smoke when using this product.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

A. Exposure limits

○ **ACGIH TLV**

- [Hydrogen chloride] : Ceiling, 2 ppm

○ **OSHA PEL**

- [Hydrogen chloride]:(C) 5 (C) 7

B. Engineering controls

- Business owner is recommended to maintain below recommended exposure limits for the working place with general exhaust of gas/vapour/mist/fume.

C. Individual protection measures, such as personal protective equipment

○ **Respiratory protection**

- Under conditions of frequent use or heavy exposure, Respiratory protection may be needed.
- Respiratory protection is ranked in order from minimum to maximum.
- Consider warning properties before use.
- Any chemical cartridge respirator with organic vapor cartridge(s).
- Any chemical cartridge respirator with a full facepiece and organic vaporcartridge(s).
- Any air-purifying respirator with a full facepiece and an organic vapor canister.
- For Unknown Concentration or Immediately Dangerous to Life or Health : Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply. Any self-contained breathing apparatus with a full facepiece.

○ **Eye protection**

- Wear primary eye protection such as splash resistant safety goggles with a secondary protection face shield.
- Provide an emergency eye wash station and quick drench shower in the immediate work area.

○ **Hand protection**

- Wear appropriate glove.

○ **Skin protection**

- Wear appropriate clothing.

○ **Others**

- Not available

9. PHYSICAL AND CHEMICAL PROPERTIES

A. Appearance	
- Appearance	Liquid
- Color	colorless
B. Odor	odorless
C. Odor threshold	Not available
D. pH	Not available
E. Melting point/Freezing point	Not available
F. Initial Boiling Point/Boiling Ranges	Not available
G. Flash point	Not available
H. Evaporation rate	Not available
I. Flammability(solid, gas)	Not available

J. Upper/Lower Flammability or explosive limits	Not available
K. Vapour pressure	Not available
L. Solubility	Not available
M. Vapour density	Not available
N. Specific gravity(Relative density)	1.015 g/cm3
O. Partition coefficient of n-octanol/water	Not available
P. Autoignition temperature	Not available
Q. Decomposition temperature	Not available
R. Viscosity	Not available
S. Molecular weight	212.29 g/mol

10. STABILITY AND REACTIVITY

A. Chemical Stability

- This material is stable under recommended storage and handling conditions.

B. Possibility of hazardous reactions

- Hazardous Polymerization will not occur.

C. Conditions to avoid

- Avoid contact with incompatible materials and condition.
- Avoid : Accumulation of electrostatic charges, Heating, Flames and hot surfaces

D. Incompatible materials

- Not available

E. Hazardous decomposition products

- May emit flammable vapour if involved in fire.

11. TOXICOLOGICAL INFORMATION

A. Information on the likely routes of exposure

○ **(Respiratory tracts)**
- Not available

○ **(Oral)**
- Harmful if swallowed

○ **(Eye·Skin)**
- Causes serious eye damage
- Causes skin irritation

B. Delayed and immediate effects and also chronic effects from short and long term exposure

○ **Acute toxicity**

*** Oral**
- Product (ATEmix) : >5000mg/kg
- [Water] : LD50 > 90000 ㎎/㎏ Rat (KOSHA)
- [Hydrogen chloride] : LD50 238 ㎎/㎏ Rat (SIDS)
- [3,3'-Dimethylbenzidine] : LD50 404 ㎎/㎏ Rat

*** Dermal**
- Product (ATEmix) : >5000mg/kg
- [Hydrogen chloride] : LD50 > 5010 ㎎/㎏ Rabbit (SIDS)

*** Inhalation**
- Product (ATEmix) : Not available
- [Hydrogen chloride] : Gas LC50 1411 ppm 4 hr Rat (NITE)

○ **Skin corrosion/irritation**
- Causes skin irritation

○ **Serious eye damage/irritation**
- Causes serious eye damage

○ **Respiratory sensitization**

- Not available

○ **Skin sensitization**

- Not available

○ **Carcinogenicity**

*** IARC**

- [Hydrogen chloride] : Group 3
- [3,3'-Dimethylbenzidine] : Group 2B

*** OSHA**

- Not available

*** ACGIH**

- [Hydrogen chloride] : A4
- [3,3'-Dimethylbenzidine] : A3

*** NTP**

- [3,3'-Dimethylbenzidine] : R

*** EU CLP**

- [3,3'-Dimethylbenzidine] : Carc. 1B

○ **Germ cell mutagenicity**

- Not available

○ **Reproductive toxicity**

- Not available

○ **STOT-single exposure**

- Not available

○ **STOT-repeated exposure**

- Not available

○ **Aspiration hazard**

- Not available

12. ECOLOGICAL INFORMATION

A. Ecotoxicity

○ **Fish**

- [Hydrogen chloride] : LC50 3.25 ㎎/ℓ ~ 3.5 ㎎/ℓ 96 hr Lepomis macrochirus

○ **Crustaceans**

- [Hydrogen chloride] : EC50 4.92 ㎎/ℓ 48 hr Daphnia magna
- [3,3'-Dimethylbenzidine] : EC50 4.5 ㎎/ℓ 48 hr (NITE)

○ **Algae**

- [Hydrogen chloride] : EC50 0.492 ㎎/ℓ 72 hr Selenastrum capricornutum

B. Persistence and degradability

○ **Persistence**

- [Water] : log Kow = -1.38
- [Hydrogen chloride] : log Kow 0.25 (ICSC)

○ **Degradability**

- Not available

C. Bioaccumulative potential

○ **Bioaccumulative potential**

- [Hydrogen chloride] : BCF 3.162 (농축가능성 낮음)
- [3,3'-Dimethylbenzidine] : BCF 83 (NITE)

○ **Biodegration**

- [3,3'-Dimethylbenzidine] : 3 (%) (NITE)

D. Mobility in soil

- Not available

E. Other adverse effects

- Not available

13. DISPOSAL CONSIDERATIONS

A. Disposal methods

- Since more than two kinds of designated waste is mixed, it is difficult to treat separately, then can be reduction or stabilization by incineration or similar process.
- If water separation is possible, pre-process with Water separation process.
- Dispose by incineration.

B. Special precautions for disposal

- The user of this product must dispose by oneself or entrust it to a waste disposer, a person who recycles other's waste or establishes and operates waste disposal facilities.
- Dispose of waste in accordance with all applicable laws and regulations.

14. TRANSPORT INFORMATION

A. UN No. (IMDG CODE/IATA DGR)

- 3082

B. Proper shipping name

- ENVIRONMENTALLY HAZARDOUS SUBSTANCES, LIQUID, N.O.S.

C. Hazard Class

- 9

D. IMDG CODE/IATA DGR Packing group

- III

E. Marine pollutant

- Not applicable

F. Special precautions for user related to transport or transportation measures

- Local transport follows in accordance with Dangerous goods Safety Management Law.
- Package and transport follow in accordance with Department of Transportation (DOT) and other regulatory agency requirements.
- EmS FIRE SCHEDULE : F-A (General fire schedule)
- EmS SPILLAGE SCHEDULE : S-F (Water-soluble marine pollutants)

15. REGULATORY INFORMATION

A. National and/or international regulatory information

○ **POPs Management Law**

- Not applicable

○ **Information of EU Classification**

*** Classification**

- [Hydrogen chloride] : H331, H314
- [3,3'-Dimethylbenzidine] : H350, H302, H411

○ **U.S. Federal regulations**

*** OSHA PROCESS SAFETY (29CFR1910.119)**

- [Hydrogen chloride] : 2267.995 kg 5000 lb

*** CERCLA Section 103 (40CFR302.4)**

- [Hydrogen chloride] : 2267.995 kg 5000 lb
- [3,3'-Dimethylbenzidine] : 4.53599 kg 10 lb

*** EPCRA Section 302 (40CFR355.30)**

- Not applicable

*** EPCRA Section 304 (40CFR355.40)**

- Not applicable

*** EPCRA Section 313 (40CFR372.65)**

- [3,3'-Dimethylbenzidine] : Applicable

○ **Rotterdam Convention listed ingredients**

- Not applicable

○ **Stockholm Convention listed ingredients**

- Not applicable

○ **Montreal Protocol listed ingredients**

- Not applicable

16. OTHER INFORMATION

A. Reference

- The information contained herein is believed to be accurate. It is provided independently of any sale of the product for purpose of hazard communication. It is not intended to constitute performance information concerning the product. No express warranty, or implied warranty of merchantability or fitness for a particular purpose is made with respect to the product or the information contained herein.
- This Safety Data Sheet was compiled with data and information from the following sources: KOSHA, NITE, ESIS, NLM, SIDS, IPCS

B. Issue date

- 2019-03-12

C. Revision number and Last date revised

- 2 times, 2026-02-10

D. Other

- This SDS is prepared according to the Globally Harmonized System (GHS).