Safety Data Sheet

Reference No. 3320

Issue: 10th October 2002
Revision: 20th May 2016

1. Chemical product and company identification

Product name Ampoule for Dissolved Oxygen Test Kit/
Dissolved Oxygen Test Kit Economy Package
Model AZ-DO-10/ AZ-DO-30

Company name KYORITSU CHEMICAL-CHECK Lab., Corp.
Address 37-11, Den-enchofu 5-chome, Ota-ku, Tokyo 145-0071, Japan
Tel +81-3-3721-9207
Fax +81-3-3721-0666
Person in charge Seiji ISHII

Recommended uses and restrictions Reagent for water quality measurement

2. Hazards identification

[GHS Classification]
Physical hazards: Classification not possible (no data for GHS classification available)

Health hazards:
Acute toxicity (oral): Category 4
Acute toxicity (dermal): Category 4
Acute toxicity (inhalation): Category 4
Germ cell mutagenicity: Category 2

For those health hazards not listed above are not classified or classification not possible (no data for GHS classification available)

Environmental hazards: Classification not possible (no data for GHS classification available)

[GHS labeling elements]

[Signal word]
Warning

[Hazard statements]
Harmful if swallowed.
Harmful if contact with skin.
Harmful if inhaled.
Suspected of causing genetic defects

[Precautionary statements]
Keep out of reach of children and store in the cool, dry, and dark place.
Carefully read instructions before use and do not use for other purposes.
Wear personal protective equipment if necessary.
Do not inhale reagent.
Wash contaminated clothing.
Wash hands well before and after handling.
Avoid release to the environment.
3. Composition/ information on ingredients

Discrimination of single substance or mixture: Mixture

<table>
<thead>
<tr>
<th>Reagent name</th>
<th>Mixed liquid reagent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical name</td>
<td>Indigocarmine (C.I. Acid Blue 74)</td>
</tr>
<tr>
<td>Content</td>
<td>&lt; 0.2%</td>
</tr>
<tr>
<td>Chemical formula</td>
<td>C16H8N2Na2O8S2</td>
</tr>
<tr>
<td>METI No. (reference number under CSCL in Japan)</td>
<td>(5)-1650</td>
</tr>
<tr>
<td>CAS No.</td>
<td>860-22-0</td>
</tr>
</tbody>
</table>

4. First-aid measures

If reagents or test solutions;
- Enter in eyes: Immediately rinse with water.
- Contact with skin: Immediately wash out contaminated site with plenty of water.
- Enter into mouth: Immediately rinse mouth with plenty of water.

If ingested or in case any symptoms appear after above measures, immediately get medical advice or treatment.

5. Fire-fighting measures

Extinguishing methods: Cut off ignition sources and extinct by a suitable media.
Suitable extinguishing media: Water (mist), powder, carbon dioxide, dry sand.

6. Accidental release measures

In case of outdoor use: Avoid spill of reagent, fragments of ampoule and waste solution.
In case of indoor use: If reagent, fragments of ampoule or waste solution spilled on a table or floor, wipe off immediately and dispose of them.

7. Handling and storage

Handling: Do not contact with eyes or skin, and avoid ingestion. Care should be made so as not to injury because the reagent is in an ampoul.
- Especially for outdoor use, ensure to bring back reagents, waste solutions after the measurement and used containers.
Storage: Avoid direct sunlight and store in a dry and cool place.

8. Exposure controls and personal protection

Administrative control level
- Working environment standard: Not established

Occupational exposure limits
- Japan Society for Occupational health: 5 ppm (7.5 mg/m³) (only Hydrochloric acid)
- ACGIH (TLVs): Cl 5 ppm (only Hydrochloric acid)
- (OSHA(PEL)): air Cl 5 ppm (only Hydrochloric acid)

Protective equipment: Recommended to wear protective glasses and gloves.
9. Physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Liquid reagent</td>
</tr>
<tr>
<td></td>
<td>0.50 mL x 10 tubes/kit glass ampoule in a cardboard box (AZ-DO-10)</td>
</tr>
<tr>
<td>Color</td>
<td>Yellow ~ Pale green</td>
</tr>
<tr>
<td>Solubility</td>
<td>Soluble in water</td>
</tr>
<tr>
<td>Relative density</td>
<td>1.01</td>
</tr>
<tr>
<td>Boiling point</td>
<td>110 °C</td>
</tr>
<tr>
<td>Melting point</td>
<td>-1 °C</td>
</tr>
<tr>
<td>Odor</td>
<td>No odor</td>
</tr>
<tr>
<td>pH</td>
<td>4</td>
</tr>
</tbody>
</table>

Melting point, boiling point, flash point, ignition point, lower explosion limit, vapor pressure, density, relative density, solubility, Pow, kinetic viscosity: not available as a mixture.

10. Stability and reactivity

Avoid leaving in a place where high temperature, humid or under direct sunlight. Stable under normal use conditions and no dangerous reactions under specific conditions are expected. No information on hazardous decomposition product is available.

11. Toxicological information

Information on toxicological effects that have been described in the SDS in the manufacturer of the ampoule containing reagents is shown.

Acute toxicity (oral):
Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual.
If swallowed, the toxic effects of glycols (dihydric alcohols) are similar to those of alcohol, with depression of the central nervous system, nausea, vomiting, and degenerative changes in the liver and kidney.
Overexposure to non-ring alcohols causes nervous system symptoms. These include headache, muscle weakness and incoordination, giddiness, confusion, delirium and coma.

Acute toxicity (dermal):
Skin contact with the material may be harmful; systemic effects may result following absorption.
The material is not thought to be a skin irritant (as classified by EC Directives using animal models). Temporary discomfort, however, may result from prolonged dermal exposures.
Most liquid alcohols appear to act as primary skin irritants in humans. Significant percutaneous absorption occurs in rabbits but not apparently in man.

Acute toxicity (inhalation):
Inhalation of vapors or aerosols (mists, fumes), generated by the material during the course of normal handling, may be harmful.
The material is not thought to produce respiratory irritation (as classified by EC Directives using animal models). Nevertheless inhalation of vapors, fumes or aerosols, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress.
Aliphatic alcohols with more than 3-carbons cause headache, dizziness, drowsiness, muscle weakness and delirium, central depression, coma, seizures and behavioural changes. Secondary respiratory depression and failure, as well as low blood pressure and irregular heart rhythms, may follow.

Eye contact:
Although the liquid is not thought to be an irritant (as classified by EC Directives), direct contact with the eye may produce transient discomfort characterized by tearing or conjunctival redness (as with wind burn).

Germ cell mutagenicity:
Strong evidence exists that this substance may cause irreversible mutations (though not lethal) even following a single exposure.
Laboratory (in vivo) and animal studies show, exposure to the material may result in a possible risk of irreversible effects, with the possibility of producing mutation.
Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure.

Chronic minor exposure to hydrogen chloride (HCl) vapor or fume may cause discoloration or erosion of the teeth, bleeding of the nose and gums; and ulceration of the nasal mucous membranes.

Repeated exposures of animals to concentrations of about 34 ppm HCl produced no immediate toxic effects.

No data on mixture is available. Data on each substance are shown.

Indigocarmine (no data on solution is available)
- **Acute toxicity:** Oral-mouse LD₅₀ = 2,500 mg/kg, oral-rat LD₅₀ = 2,000 mg/kg
- Subcutaneous injection-mouse LD₅₀ = 405 mg/kg, Intravenous-rat LD₅₀ = 93 mg/kg (RTECS)
- Other data: Not available

Potassium hydrogen phthalate:
- **Acute toxicity:** Oral-rat LD₅₀ > 3,200 mg/kg, Dermal-hamster LD₅₀ > 1 mg/kg (both from RTECS)
- Other data: Not available

Diethylene glycol (no data on solution is available)
- **Acute toxicity:** Oral-rat LD₅₀ = 12,565 mg/kg, Interperitoneal-rat LD₅₀ = 7,700 mg/kg
- Subcutaneous injection-rat LD₅₀ = 18, 800 mg/kg, Oral-mouse LD₅₀ = 23,700 mg/kg
- **Skin corrosion/ irritation:** Human 122 mg/3-days (intermittent) Mild, Rabbit 500 mg, Mild
- **Serious eye damage/ eye irritation:** Rabbit 50 mg, Mild (RTECS)
- Other data: Not available.

Hydrochloric acid (gas) (no data on solution is available):  
- **Acute toxicity:**  
  - Oral: Classified as Category 3 based on data; Rat: LD₅₀ = 238 - 277, 700 mg/kg (SIDS (2002)).
  - Dermal: Not classified based on data; Rabbit LD₅₀ > 5,010 mg/kg (SIDS (2002)).
  - Inhalation (gas): Classified as Category 3 based on data; 1,411 ppm was obtained from statistical calculation of converted value of rats: LC₅₀ = 4.2 mg/L, 4.7 mg/L, 238 mg/L/60 min (SIDS (2002)). Note that 4.2 mg/L (4-hr ppm = 1,411 ppm) was used because the calculated value was smaller than the lowest data.
  - Inhalation (dust, mist): Classified as Category 2 based on data; Rat LC₅₀ (aerosol) = 1.68 mg/L/1hr (SIDS (2002)) which is equivalent to 0.42 mg/L/4hr.
- **Skin corrosion/ irritation:** Classified as Category 2 based on data; Rabbit: Corrosive to the skin by 1 – 4 hour exposure depending on concentrations (SIDS (2002)). Mouse, rat: Skin irritation and inflammation associated with changes of color by 5 – 30 minutes exposure (SIDS (2002)). Human: Mild to severe irritation, ulcer and skin burns (SIDS (2002)).
- **Serious eye damage/ eye irritation:** Classified as Category 1 based on data; Causes serious eye irritation, damage and corrosion in multiple animal tests including rabbits (SIDS (2002)). It also reported that may cause persistent eye damage and blindness in humans (SIDS (2002)).
- **Respiratory or skin sensitization**
  - Respiratory sensitization: Classified as Category 1 based on data; Japanese Society of Occupational and Environmental Allergy lists as an occupational sensitizer. It is reported that caused bronchial spasm after the exposure of cleaning product containing hydrochloric acid furthermore caused asthma by a limited irritation after one year of the incident. (ACGIH (2003)).
  - Skin sensitization: Not classified based on data; Negatives in a guinea pig maximization test and a mouse ear swelling tests (SIDS (2002)) and no positive case was found among 15 people applied after10 – 14 days of induction (SIDS (2002)).
- **Germ cell mutagenicity:** Classification is not possible because: No in vivo test data is found except in a positive result of drosophila sex-linked recessive lethal test. Some positive results are reported in vitro test however it is not sufficient to conclude mutagenic to human germ cell.
- **Carcinogenicity:** Not classified based on data; IARC Group 3 (1992), ACGIH A4 (2003). No evidence which indicates carcinogenicity was reported in rats and mice studies (SIDS (2002)). Epidemiological studies are of negative regarding relationships between carcinogenicity and exposure of hydrochloric acid (IARC 54 (1992), PATTY 5th (2001)).
- **Reproductive toxicity:** Classification is not possible because of data lack based on available data; No developmental effect was observed in rats and mice administered during pregnancy period. Effects on reproduction or fertility are not known if exposed before mating or during early developmental stage.
- **Specific target organ toxicity (single exposure):** Classified as Category 1 (respiratory organs) based on animal and human data; Following effects in humans are reported by inhalation exposure; breathing difficulty, inflammation of pharynx, bronchitis, bronchoconstriction, pneumonia, effects on upper airways such as edema, inflammation and necrosis and lung edema (DFGOT vol.6 (1994), PATTY 5th (2001), IARC 54 (1992), ACGIH (2003)).
In animal test also reported that toxicological and morphological effects in lungs and bronchial tubes were observed e.g. bronchitis associated with necrosis of mucous membranes, lung edema, bleeding and thrombus (ACGIH (2003), SIDS (2002)).

Specific target organ toxicity (repeated exposure): Classified as Category 1 (teeth and respiratory organs) based on data; Damages of teeth by diabrosis in multiple cases are reported in human repeated exposure (SIDS (2002), EHC 21 (1982), DFGOT vol.6 (1994), PATTY 5th (2001), ). It is also reported that increased incidence of chronic bronchitis (DFGOT vol.6 (1994)).

Other data: Not available

EDTA disodium salt dehydrate (no data on solution is available):

Acute toxicity: Oral-rat LD$_{50}$ = 2,000 mg/kg
Oral-rat LD$_{50}$ = 3,700 mg/kg; cramp or threshold of paroxysm effects, disability of moving, effects on stomach and digestive organs, excessive mobility, diarrhoea.
Oral-rabbit LD$_{50}$ = 2,300 mg/kg
Interperitoneal-mouse LD$_{50}$ = 260 mg/kg (all data reported in RTECS)
It is reported that calcium deficiency and hypocalcemia are induced in humans by excessive intake.

Skin corrosion/irritation:
Powders irritate to eyes, skin and airways.

Serious eye damage/eye irritation:
The substance is applied for clinical use and is considered as having low irritation/ corrosion potential.

Skin sensitization: Negative in a guinea pig study (10% solution as a 3Na salt).
Germ cell mutagenicity: Negative in an Ames, positive in a mouse micronucleus (more than 5 mg/kg) and in a mouse lymphoma gene mutation (more than 0.00252 mol/L) studies.
Carcinogenicity: Negative in mouse and rat feeding studies: 7,500 ppm/ 103 weeks (as 3Na salt)
Reproductive toxicity: Oral-rat, 1,000 mg/kg/day, 7-14 days study: Diarrhea in mother animal but teratogenicity was negative.
Oral-rat, 2% (0-21 days), 3% (6-14 or 6-21 days): Caused diarrhea in mother animal. Palatoschisis, atrophia and loss of chin, and twist tail were confirmed in unborn children.

Chronic/long-term toxicity:
Diarrhea, decreased hemoglobin, prolonged clotting time were confirmed in a rat repeated dose oral study.

Other data: Not available.

Water:
Acute toxicity: Oral-rat LD$_{50}$ >90 mL/kg (used 90g/kg for the calculation of ATEmix below)
Other data: Not available

12. Ecological information

No data on mixture is available. Data on each substance are shown.

<table>
<thead>
<tr>
<th>Persistance: Water/Soil</th>
<th>Persistance: Air</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water:</td>
<td></td>
</tr>
<tr>
<td>Diethylene glycol:</td>
<td></td>
</tr>
<tr>
<td>Hydrochloric acid:</td>
<td></td>
</tr>
<tr>
<td>EDTA disodium salt dehydrate:</td>
<td></td>
</tr>
<tr>
<td>Proprietary ingredient:</td>
<td></td>
</tr>
<tr>
<td>Indigocarmine:</td>
<td></td>
</tr>
</tbody>
</table>

Bioaccumulation:

| Water:                  | Low (Log Kow = -1.38) |
| Diethylene glycol:      | Low (BCF = 180)       |
| Hydrochloric acid:      | Low (Log Kow = 0.5392)|
| EDTA disodium salt dihydrate: | Low (Log Kow = -3.8573) |
| Proprietary ingredient: | Low (Log Kow = -1.8799)|
| Indigocarmine:          | High (Log Kow = -0.9914)|

Mobility in soil:

| Water:                  | Low (Koc = 14.3) |
| Diethylene glycol:      | High (Koc = 1)   |
13. Disposal considerations

pH of waste solution after the measurement is 4. Always dispose of in accordance with local regulations.

14. Transport information

In addition to precautionary measures regarding handling and storage, avoid rough handling so as not to break containers. It is recommended to ship by air because under high temperature for long period may lead to deterioration.

UN classification and number: Not applicable
Civil Aeronautics Act: Not applicable
Poisonous and Deleterious Substances Control Act: Not applicable
Fire Service Act: Not applicable
Total weight of the product: ca.70 g/kit (AZ-DO-10) ca.190 g/kit (AZ-DO-30)

15. Regulatory information

PRTR Act: Not applicable
Industrial Safety and Health Act: Applicable
Material Safety Data Sheet No. JW041678, Wako Pure Chemical Industries, Ltd. (2009.05.18)
Material Safety Data Sheet No. JW042591, Wako Pure Chemical Industries, Ltd. (2009.05.19)
Material Safety Data Sheet No. JW160382, Wako Pure Chemical Industries, Ltd. (2009.05.20)
Material Safety Data Sheet No. JW041678, Wako Pure Chemical Industries, Ltd. (2009.05.18)
Material Safety Data Sheet N001, Dojindo Laboratories. (2005.05.23)
JIS Z 7252:2014 Classification of chemicals based on "Globally Harmonized System of Classification and Labelling of Chemicals (GHS)" (Japanese Industrial Standards Committee)
JIS Z 7253:2012 Hazard communication of chemicals based on GHS-Labelling and Safety Data Sheet (SDS) (Japanese Industrial Standards Committee)
UN GHS (tentative translation, forth revised version), GHS Kankei Syocho Renraku Kaigi (2011)

NOTE) This information is not always exhaustive and use with care.
This English SDS is prepared in the reference with SDS, “SAFETY DATA SHEET: Dissolved Oxygen Vacu-vials Ampoules & CHEMets Refill, SDS No.K7503, Version No.2.3, Print Date 12/03/2015, CHEMetrics, Inc.” and information about each containing ingredients in ampoules.
This data sheet only provides information but any description cannot be warranted.
Descriptions may possibly be changed because of new findings or modification of the current knowledge.
Precautions only cover normal handling.