Safety Data Sheet (SDS)

Antimony Trisulfide

1.CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Substance name(Product name):	Antimony Trisulfide (P2, P3, P4, P5)
Company name:	NIHON SEIKO CO.,LTD.
Address	3-2 SHIMOMIYABI-CHO SHINJUKU-KU TOKYO 162-0822 JAPAN
Charge section	NIHON SEIKO CO.,LTD. SALES SECTION
Phone number	+81-3-3235-0031
Fax number	+81-3-3235-0034
E-mail address	mail@nihonseiko.co.jp
Emergency telephone number	NIHON SEIKO CO.,LTD. NAKASE REFINERY QUALITY ASSURANCE SECTION +81-79-667-2121
Recommended use and restriction on use:	Industrial materials: Lubricant, Fireworks, gunpowder for toy, pseudo cannonball, etc.

2.HAZARDS IDENTIFICATION

GHS classification :

Physical hazards		:Out of category (Not classified)
Health hazards	Acute Toxicity (Oral)	:Classification not possible
	Acute Toxicity (Dermal)	:Classification not possible
	Acute Toxicity (Inhalation: dust/mist)	:Classification not possible
	Acute Toxicity (Inhalation: fume/vapors)	:Out of category
	Skin corrosion/irritation	:Classification not possible
	Serious eye danger/eye irritation	:Classification not possible
	Respiratory sensitization	:Classification not possible
	Skin sensitization	:Classification not possible
	Germ cell mutagenicity	:Classification not possible
	Carcinogenicity	:Not classified
	Reproductive toxicity	:Classification not possible
	Specific target organ systemic toxicity (Single exposure)	:Classification not possible
	Specific target organ systemic toxicity (Repeated exposure)	:Classification not possible
	Aspiration hazard	:Classification not possible
Environmental hazards	Hazardous to the aquatic environment (Acute)	:Classification not possible
	Hazardous to the aquatic environment (Chronic)	:Classification not possible
	Hazardous to the ozone layer	:Classification not possible

NIHON SEIKO CO., LTD.

GHS label:	
Hazard pictogram	Not applicable.
Signal word	Not applicable.
Hazard statements	Not applicable.
Precautionary statements	【Prevention】 Not applicable. 【Response】 Not applicable. 【Storage】 Not applicable. 【Disposal】 Not applicable.
Other hazard not applicable to GHS classification hazard:	No information.
The summary of important signs and assumed emergency:	No information.

3.COMPOSITION / INFORMATION ON INGREDIENTS

Substance/Mixture:	Substance
General product description:	Antimony Trisulfide
Other name:	Diantimony Trisulfide
Chemical property (Chemical formula etc):	Sb_2S_3
CAS number:	1345-04-6
Component and its content:	Sb_2S_3:98.6%
EINECS number:	215-713-4
Impurity and stabilizing additive that contribute to GHS Classification:	As:0.06%, Pb:0.12%, SiO_2:0.61%

4.FIRST AID MEASURES

Following inhalation:	Move affected person to fresh air. Seek medical attention
Following skin contact:	Wash with water and remove clothes if necessary.
Following eye contact:	Flush eyes thoroughly with water, also under eyelids.
After ingestion:	Rinse mouth with water.
Most important symptoms and effects ,both acute and delayed:	No information.
Protection of person who do first aid:	No information.
Special precaution statement for doctor:	No information.

5.Fire-fighting measure

Extinguishing media:	Use fire-fighting measures that suit the environment. Water, Fire-extinguishing powder, Carbon dioxide, Sand
Unsuitable extinguishing media:	Halogenated fire extinguishing, Fire-extinguishing foam (May cause fire.)
Special hazards arising from the Substance or mixture:	May generate antimony oxide smog and sulfur dioxide in fire emergency.
Specific fire-fighting:	Move the container from fire area, if it can be done without risk..
Protection for fire-fighter:	Wear suitable protective equipment in fire-fighting.

6.Accidental release measures

Personal precautions, protective equipment and emergency procedures:	Avoid formation of dust. Ensure adequate ventilation. Keep unprotected persons away. It is advised to avoid contact with skin, eyes, and clothing – wear suitable protective equipment. Avoid inhalation of dust.
Environmental precautions:	It is advised that in the event of an accidental release the product should be prevented from reaching the sewage system or any water course and penetrating the soil. Dispose of spilled material in accordance with the relevant regulations.
Methods and material for Containment and cleaning up:	In any case avoid dust formation. Sweep all spilled material or use an appropriate industrial vacuum cleaner. Collect spilled material in suitable containers or closed plastic bags for recovery or disposal.
Prevention of second disaster:	For more information on exposure controls/personal protection or disposal considerations, check section 8 and 13 of this safety data sheet.

7.Handling and storage

Handling:	
Technological countermeasure (local ventilation/ General Ventilation etc)	Provide a local dust collection system in the places where dust can be generated. Provide dust protective mask in the handling position.
Safety precaution	Do not handle until all safety precautions have been read and understood. Work by wearing suitable protective equipment.
Avoid contact	Check section 10.
Hygiene measure	Avoid inhalation or ingestion. General occupational hygiene measures are required to ensure a safe handling of the substance. These measures involve good personal and housekeeping practices (i.e. regular cleaning with suitable cleaning devices). No eating, drinking and smoking at the workplace. Wash hands after use. Remove contaminated clothing and protective equipment before entering eating areas. Shower and change clothes at end of work shift. Do not wear contaminated clothing at home. Do not blow dust off with compressed air.
Storage:	
Safety storage condition	Store in well ventilated dry area with low humidity and sealed state in order to avoid moisture absorption.
Safety packaging material	Establish whether the container conforms test standard on a voluntary basis.

8.EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering controls:	Prevent formation of dust where possible. Ensure appropriate ventilation/exhaustion at machinery and places where dust can be generated. Any deposit of dust which cannot be avoided must be regularly removed using preferably appropriate industrial vacuum cleaners or central vacuum systems. Waste air is to be released into the atmosphere only when it has passed through suitable dust separators. Waste water generated during the production process or cleaning operations should be collected and should preferably be treated in an on-site waste water treatment plant which ensures efficient removal of antimony.
Exposure control limits	
Effect of over exposure:	
ACGIH(2012)	0.5mg/m^3 TLV-TWA (Antimony and compounds, as Sb)
Personal protective equipment:	
Respiratory protection	Dust protective mask(As appropriate)
Hand protection	Protective gloves
Eye protection	Protective glasses
Skin and body protection	Protective high boots and cloth
Special precaution statement	Avoid environmental discharge.

9.PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	
Physical state	Solid
Figure	Powder or small massive form
Color	Charcoal gray
Odor:	Odorless
Odor threshold:	Not applicable as odorless.
pH:	No information.
Melting point:	506°C
Initial boiling point and boiling range:	>600°C
Flash point:	No information.
Evaporation rate:	No information.
Flammability (solid, gas):	No information.
Upper/lower flammability or explosive limits:	No information.
Vapor pressure:	1.17mmHg(500°C)
Vapor density:	No information.
Relative density:	4.562g/cm^3
Solubility(ies):	0.000175g/100cc water (18°C)
Partition coefficient n-octanol/water:	No information.
Auto-ignition temperature:	No information.
Decomposition temperature:	No information.
Viscosity:	No information.
Other:	No information.

10.STABILITY AND REACTIVITY

Reactivity:	No information.
Chemical stability:	Under normal conditions of use and storage, the product is stable.
Possibility of hazardous reactions:	When heated in the air, it burns with a blue flame and antimony oxide and sulfur dioxide is generated. It decomposes and generates toxic hydrogen sulfide if it meets strong acids. Antimonic acid is generated when dissolved in alkali.
Conditions to avoid:	Heating

Incompatible materials:	Halogen, Strong acids/bases
Hazardous decomposition products:	Hydrogen sulfide, Sulfur dioxide, Antimony oxide
Other:	No information.

11.TOXICOLOGICAL INFORMATION

Acute Toxicity (Oral):	LD_{50} rat >2,000 mg/kg bw Classification not possible, because of a lack of information.
Acute Toxicity (Dermal):	LD_{50} rat >2,000 mg/kg bw Classification not possible, because of a lack of information.
Acute Toxicity (Inhalation: dust/mist):	LC_{50} rat >5 mg/L/4h Classification not possible, because of a lack of information.
Acute Toxicity (Inhalation: fume/vapors):	Out of category to powder.
Skin corrosion/irritation:	Classification not possible, because of a lack of information.
Serious eye danger/irritation:	Classification not possible, because of a lack of information.
Respiratory or skin sensitization:	Classification not possible, because of a lack of information.
Germ cell mutagenicity:	Classification not possible, because of a lack of information.
Carcinogenicity:	
Japan Society for Occupational Health	Not classified as carcinogen.
ACGIH	Not classified as carcinogen.
EPA	Not classified as carcinogen.
NTP	Not classified as carcinogen.
EU	Not classified as carcinogen.
IARC	Group 3
Reproductive toxicity:	Classification not possible, because of a lack of information.
STOT single exposure:	Classification not possible, because of a lack of information.
STOT repeated exposure:	Classification not possible, because of a lack of information.
Aspiration hazard:	Classification not possible, because of a lack of information.
Other:	No information.

12.ECOLOGICAL INFORMATION

Antimony metal and antimony containing compounds will dissolve and generate antimony ions. The environmental section will therefore discuss the fate of antimony in general.

Ecotoxicity: The test result is given below

Acute aquatic toxicity test results:		
Marine fish [Red seabream, Pargus major]	96 h LC50	=6.9 mg Sb/L (Takayanagi, 2001)
Freshwater fish [Pimephales promelas]	96 h LC50	=14.4 mg Sb/L (Brooke et al, 1986)
Invertebrates [Chlorohydra viridissimus]	96 h LC50	=1.77 mg Sb/L (TAI, 1990)
Algae [Pseudokirchneriella subcapitata]	72 h ErC50 (growth rate)	>36.6 mg Sb/L (Heijerick et al,2004)
Plants [Lemna minor]	4 d EC50	> 25.5 mg Sb/L (Brooke et al, 1986)
Chronic aquatic toxicity test results:		
Fish [Pimephales promelas]	28 d NOEC/LOEC (growth; length)	= 1.13/2.31 mg Sb/L (Kimball, 1978)
Invertebrates [Daphnia magna]	21 d NOEC/LOEC (reproduction)	= 1.74/3.13 mg Sb/L (Heijerick et al, 2003)
Algae [Pseudokirchneriella subcapitata]	72 h NOEC/LOEC (growth rate)	= 2.11/4.00 mg Sb/L (Heijerick et al, 2004)

Persistence and degradability:	Antimony cannot be degraded, but may be transformed between diffe rent phases, chemical species, and oxidation states. Antimony is theref ore considered to be persistent (P) and very persistent (vP) like any other metal.
Bioaccumulative potential:	Bioaccumulation of antimony by both aquatic and terrestrial organisms is low. A BCF of 40 has been determined for aquatic organisms and a BSAF of 1 for earthworms.
Mobility in soil:	log K_p = 2.07
Hazardous to the ozone layer:	No information is provided about ozone depletion potential(ODP).
Other:	No information.

13.DISPOSAL CONSIDERATIONS

Waste from residues:	Dispose of contents in accordance with local/regional/national /international regulations(to be specified).
Contaminated container/packing:	Dispose of contents in accordance with local/regional/national /international regulations(to be specified).

14.TRANSPORT INFORMATION

International regulation:	
UN code	Not applicable.*
Proper shipping name	Not applicable.
UN Class	Not applicable.
Packing group	Not applicable.
Marine pollutant	Not applicable.

*UN regulation : The special provision SP45 is applicable to the UN number 1549 (Hazard class6.1 and packaging groupⅢ). It means that antimony sulfides and oxides, which contain not more than 0.5% of arsenic calculated on the total weight, are not subject to these regulations.

15.REGULATORY INFORMATION

Worldwide chemical inventories:	
ENCS(Japan)	1-567
TSCA(USA)	Listed
ECL(Korea)	KE-01883
DSL(Canada)	Listed
PICCS(Philippines)	Listed
AICS(Australia)	Listed
IECSC(China)	Listed
Other regulatory information:	Follow regulation and low of each country or region.

16. OTHER INFORMATION

Treatment of stated contents:	The contents of this information sheet are based on the data, information available at moments, and may be revised by additional data coming up in future. The precautions mentioned in this sheet are intended for normal use of this material, when use in unusual manner, the proper safety method is required. Read this SDS before use the ingredients. Keep this SDS in your file for your timely reference. The contents of this information sheet are not warranted and the company can accept no liability to any customer or any other person.
References:	1.GHS taiou guideline Edit: Japan Chemical Industry Association Issuance: Japanese Standards Association 2.Antimony Trioxide SDS form of International Antimony Association (i2a)

<table>
<tr>
<td>Revision:</td>
<td>3.Sodum Antimonate SDS form of International Antimony Association (i2a)
4.【Kaiteidai3ban】Kinkyujioukyusochishishin
Issuance: Japanese Standards Association
5.Kyoyonodonokankoku (2011)
Japanese Society of Occupational Health
6.National Institute of Technology and Evaluation (NITE)_
Chemical Risk Information Platform (CHRIP)_Antimony
7.OECD-SIAM(October 14-16. 2012)SIDS Initial Assessment Profile
8.National Institute of Technology and Evaluation (NITE)_
Chemical Risk Information Platform (CHRIP)_ Antimony Trisulfide
9. International Antimony Association (i2a) Homepage
10.TRANSPORT OF DANGEROUS GOODS Model Regulations 17th vol I en United Nation
11.Shokubanoanzen site: GHS taiou model label・model MSDS Jouhou: Antimony trisulfide
Ministry of Health, Labour and Welfare (Japan)
12.Mukikagakuzensyo IV-4 Issuance: MARUZEN CO., LTD.
<table>
<tr><th>Revision No.</th><th>Issue date</th><th>Comment</th></tr>
<tr><td>01</td><td>July 01, 1998</td><td>New issue</td></tr>
<tr><td>02</td><td>Aug 01, 2006</td><td>Addition of UN regulation to section 14</td></tr>
<tr><td>03</td><td>July 20, 2010</td><td>Total revision to comply with GHS</td></tr>
<tr><td>04</td><td>Jan 21, 2013</td><td>Revision to comply with GHS taiou guideline(2012) and SDS form of i2a</td></tr>
</table>
</td>
</tr>
</table>