

Safety Data Sheet

Prepared to US OSHA, CMA, ANSI, European Directives and the UN Globally Harmonized System, 3rd Edition

1. Chemical Product Identification

GHS Product Identifier: 160.04, Methyl Iodide, Iodomethane
Manufacturer/Supplier: Deepwater Chemicals, Inc. 1210 Airpark Road, Woodward, Oklahoma 73801; Tel: 800-854-4064, Website: www.deepwaterchemicals.com
Recommended Use: Methyl Iodide is an excellent methylating agent and highly reactive. Methyl Iodide is available on a commercial basis and reasonably affordable. Can be use as a catalyst in the production of Acetic Acid and has been proposed as a pre-plant biocide used to control insects, plant parasitic nematodes, soil borne pathogens and weed seeds.
(24) Hour Emergency Contact: Chemtrec 800-424-9300
Technical Service: 580-334-3539



2. Hazard Identification

DANGER! Toxic if swallowed. Acute Toxicity Category 3. Harmful in contact with skin. Causes skin irritation. Toxic if inhaled. May cause respiratory irritation. Suspected of causing cancer. Category 2 Carcinogen. Do not breathe dust/fume/gas/mistvapors/spray. Wear protective gloves/protect clothing/eye protection/face protection. If inhaled, immediately call a Poison Center or doctor/physician.

3. Composition/Information on Ingredients

Chemical Identity	Molecular Weight	Chemical Formula	CAS#	EINECS#	Percent%
Iodomethane	141.94	CH ₃ I	74-88-4	200-819-5	98.0-100

4. First Aid Measures and Acute Health Hazards

Eye Contact: Avoid breathing Dust/Fume/Gas/Mist/Vapors/Spray. May cause eye irritation as both a liquid and as a vapor. Splashes may cause severe eye irritation and possible permanent and irreversible eye damage. IF IN EYES:

Flush with copious amounts of water for 30 minutes, occasionally lifting the upper and lower lids. Get medical advice/attention.

Skin Contact: Remove/Take off immediately, all contaminated clothing. Causes irritation, rash and blister formation. Prolonged contact can cause vesicant burns. Can be absorbed through the skin with toxic effects. IF ON SKIN:

If irritation persists and blistering occurs, Get medical advice/attention. Symptoms can be delayed for up to 12 hours. Physician should treat symptomatically and supportively using a crème or aqueous suspension containing Silver Sulfadiazine.

Ingestion: Ingestion may damage the gastrointestinal tract and chemical induced pneumonia. Severe intoxication can occur with symptoms of central nervous system depression. Coma, convulsions and death may follow. IF SWALLOWED:

Immediately call a POISON CENTER or doctor/physician.

Inhalation: Inhalation of vapors can irritate the respiratory tract. Overexposure may produce symptoms of vertigo, delirium and mental disturbances. Other symptoms may include slurred speech, drowsiness, coughing, nausea and vomiting. Higher exposure can cause serous fluid build up in the lungs resulting in pulmonary edema. IF INHALED:

If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. Give oxygen. Get medical advice/attention.

Chronic Exposure/Target Organs: Prolonged or repeated exposure to smaller doses causes primarily central nervous effects. Symptoms may include slurred speech, blurred vision, Parkinsonian rigidity and rigidity memory defects. Target organs include the Central Nervous System and Lungs.

Aggravation of Pre-existing Conditions: Persons with pre-existing skin disorders or eye problems or impaired respiratory function and asthma may be more susceptible to the effects of this substance.

5. Fire Fighting Measures

Flash Point: No Data Available	Method Used: Not Applicable	
LEL %: No Data Available	Auto Ignition Temp: NDA	
UEL%: No Data Available		

Fire and Explosion Hazards : Noncombustible. High vapor pressure may cause containers to burst at elevated temperatures. Fire may produce poisonous or irritating gases or fumes of Iodine.

Extinguishing Media: Use dry chemical, CO₂ or water spray.

Fire Fighting Instructions:

Small Fires: Use dry chemical, CO₂ or water spray.

Large Fires: Use water spray, fog or regular foam. Move containers from area if you can without risk. Dike fire control water for later disposal. Do not scatter material. Wear full protective clothing and NIOSH approved SCBA apparatus with a full-face respirator. See the Emergency Response section, Fire, from the Emergency Response Guidebook, ERG# 151 for additional information.

6. Accidental Release Measures

Evacuation: See the Table of Initial Isolation and Protective Action Distances from the Emergency Response Guidebook, ERG# 151.

Containment: Ventilate area of leak and spill. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Eliminate source of spill if possible. Contain and recover liquid when possible. Collect in an appropriate container or absorb with an inert material, i.e, vermiculite, dry sand earth, and place in a chemical waste drum. Do not use combustible materials, such as sawdust. Do not flush to sewer!

Reporting: In the event of a Hazardous Materials Incident during transportation, the regulations in 49CFR 171.15 and 171.16 are to be followed. Under 40CFR 302.6 (CERCLA), any release of Methyl Iodide in a quantity equal to or greater than 100 Lbs to soil, water or air, as soon as that person has knowledge of the release, the US Coast Guard National Response Center at 800-424-8801 must be contacted.

7. Handling and Storage

Storage Conditions: Store in UN-rated containers in a cool, dry, well-ventilated area away from incompatible substances, direct sunlight or elevated temperatures. Keep containers tightly closed and preferably under a nitrogen blanket. Protect against physical damage. Wear special protective equipment for maintenance or cleaning where exposures may exceed permissible levels. Shower and dispose of outer clothing and change to clean garments at the end of the day. Wash hands before eating and do not eat, drink or smoke in workplace. Containers of this material may be hazardous when empty since they retain product residues. This product should be handled only by, or under the close supervision of those properly qualified in the handling and use of highly hazardous chemicals. LIGHT SENSITIVE.

8. Exposure Controls/Personal Protection

<u>Substance (CAS#)</u>	<u>ACGIH- TLV</u>	<u>ACGIH- STEL</u>	<u>OSHA- PEL</u>	<u>OSHA- STEL</u>
Iodomethane (74-88-4)	2 ppm--skin	Not established	5 ppm--skin	Not established

Engineering Controls/Ventilation: Use appropriate and MACT engineering controls to reduce air contamination to approved or permissible standards. Where such systems are not effective or not feasible, wear suitable personal protective equipment, which performs satisfactorily and meets local/national standards.

Eye/Face Protection: Avoid eye contact with Methyl Iodide liquid or vapors. Eye contact can be avoided by wearing a full-face shield or safety glasses with side and brow protection. Goggles are not recommended since vapors can be trapped inside and cause injury. Refer to OSHA's 29 CFR 1910.133 Eye and Face Protection Standard for regulatory compliance.

Skin Protection: Proper protective gloves should be worn when handling hazardous or toxic materials. The degradation and permeation characteristics of the glove material selected must be appropriate for protection from the material being handled. Glove selection guides should be consulted. Rubber, Nitrile, PVC coated, Neoprene, Vinyl or Butyl gloves do not offer proper protection in the permeation of Methyl Iodide liquid or vapors and in fact can trap vapors against the skin causing injury. It is recommended that a SilverShield™ 5- laminate polypropylene glove, sleeve and apron be used when operations involving Methyl Iodide exposure are below the Permissible Exposure Limits (PEL). For manufacturing, packaging, sampling processes or emergency response operations in which there is a potential for exposure above the PEL it is recommended that personnel wear a Tychem BR™ Chemical Suit with protective gloves and boots.

Respiratory Protection: The use of an air-purifying respirator is recommended only when the exposure to Methyl Iodide vapor is below the Permissible Exposure Limit (PEL). Always use a NIOSH approved respirator when necessary with the proper gas/vapor cartridge. Observe the manufacturer's cartridge service-life and the recommended change schedule. Due to Methyl Iodide having a Boiling Point below 42° C, the service life of gas/vapor cartridges should not exceed one (8) hour shift due to cartridge desorption rate. If the exposure limit is exceeded, a supplied-air respirator (airline or SCBA) is required. Refer to OSHA's 29 CFR 1910.134 Respiratory Protection Program for regulatory compliance is the use of these respirators.

9. Physical and Chemicals Properties

Appearance:	Clear, colorless to pale yellow liquid
Odor:	Sweet ethereal to nutty odor
Physical State:	Refractive liquid, may darken upon exposure to light
pH:	5.0-5.2
Boiling Point:	42.5 °C
Melting Point:	-66.5 °C
Freezing Point:	NA
Vapor Pressure:	400 mmHg at 25 °C
Vapor Density:	4.9 (Air=1)
Specific Gravity:	2.28 at 25 °C
Evaporation Rate:	NDA
Solubility in Water:	14.2 g/L water at 25 °C
Percent Solids by Weight:	NDA
Percent Volatile:	100
Volatile Organic Compounds	NDA
Molecular Weight	141.94

Note: The physical data presented above are typical values and should not be construed as a specification.

10. Stability and Reactivity

Chemical Stability:	Stable at room temperature in sealed containers. Turns yellow, red to brown upon exposure to light, due decomposition and the liberation of free Iodine. Decomposes at 270 °C
Hazardous Polymerization:	Will not occur
Flash Point:	NDA
Auto Ignition:	NDA
Incompatibility with Other Materials	Strong oxidizers, alkali metals, reducing agents
Hazardous Decomposition Products	Burning will produce toxic iodine vapors

11. Toxicological Information

Substance (CAS No.)	Methyl Iodide	74-88-4
Acute Testing	Route of Entry	Value/Critical Effects
Eye Irritation		Severe with corneal effects > 21 day
Skin Irritation		Moderate at 72 Hours
Skin Sensitization		Negative (M/K Maximization test)
Dermal Toxicity	LD ₅₀ (dermal) rabbit	> 2,000 mg/kg
Oral Toxicity	LD ₅₀ (oral) rat	80 mg/kg (male); 132 mg/kg (female)
Inhalation Toxicity	LC ₅₀ (inhl 4-hour vapor) rat	691 ppm (4 mg/L)

Subchronic: In a study with rats exposed to Iodomethane vapor at concentrations of 5, 20, and 70 ppm for six hours per day, five days per week for thirteen weeks, treatment-related effects occurred only at the high dose level. Treatment-related effects included decreased body weight gain, alterations in the nasal epithelium and increased serum cholesterol. An increase in relative liver weights of females exposed to 70 ppm was identified but not considered toxicologically significant.

Chronic Exposure/Carcinogenicity: The International Agency for Research on Cancer (IARC) has evaluated the potential carcinogenicity of Iodomethane in 1977, 1986 and 1999. The 1986 IARC working group determined that there is limited evidence in experimental animals for the carcinogenicity of Iodomethane and the most recent IARC working group determined that no epidemiological data relevant to the carcinogenicity of Iodomethane was available. Iodomethane was removed from the U.S. National Toxicology Program Annual Report on Carcinogens in 1991 based on a finding of "equivocal" evidence for carcinogenicity. Iodomethane is listed as a carcinogen under California's Safe Drinking Water and Toxics Enforcement Act of 1986 (Proposition 65)

based on Limited evidence based on one study involving exposure by injection. NIOSH considers Iodomethane to be a potential occupational carcinogen.

Teratology/Developmental Toxicity: In a study with pregnant Sprague-Dawley rats exposed to Iodomethane vapor at concentrations of 5, 20 and 60 ppm for six hours per day during days 6-19 of gestation, there was no developmental toxicity observed at any

exposure level. Reductions in dam body weight, food consumption and weight gain compared to controls were observed only at the 60 ppm dose level. The NOAEL for developmental effects was 60 ppm. The NOAEL for maternal toxicity was 20 ppm. In a study with New Zealand white rabbits exposed to Iodomethane vapor at concentrations of 2, 10 and 20 ppm for six hours per day during days 6-28 of gestation, significant weight loss was observed in the high dose group late in gestation (days 21-29). A slight decrease in body weight gain was observed in maternal animals at the mid-dose group. An increase in late resorptions and numbers of viable fetuses were observed at the high dose and a slight increase in late resorptions was observed at the mid-concentration. The NOAEL for developmental effects was 2 ppm and the NOAEL for maternal toxicity was considered to be 10 ppm.

Reproductive Toxicity: In a 2-generation reproduction study with rats exposed to Iodomethane vapor at concentrations of 5, 20 and 50 ppm, treatment-related reproductive effects were noted only in the 50 ppm group for F₁ based on changes on female production. No reproductive effect was observed in the F₀ group. Non-reproductive parental systemic effects and neonatal toxicity were observed at the 20 and 50 ppm level. These effects included decreased body weight and body weight gains for both sexes, decreased adrenal gland weights, decreased food consumption, alterations in nasal tissues, increased thymus weights in males, decreased pup weights, decreased mean litter size and pup survival, decreased weights in pups and increased mean day of acquisition of vaginal patency and decreased body weight on the day of acquisition of balanopreputial separation. The NOAEL for parental and neonatal toxicity was 5 ppm. The NOAEL for reproductive toxicity was 20 ppm.

Mutagenicity/Genotoxicity: The potential genotoxicity of Iodomethane was evaluated in several *in vitro* and *in vivo* genetic toxicity test systems. The weight of evidence indicates that Iodomethane is not genotoxic. Iodomethane was negative in the Ames Assay with a number of strains of *Salmonella typhimurium* and *E. coli*. Iodomethane did not cause *in vitro* mammalian cell gene mutations and it was negative in the *in vivo* bone marrow micronucleus assay. Iodomethane was positive for the induction of structural chromosome aberrations and negative for the induction of numerical chromosome aberrations in Chinese hamster ovary (CHO) cells.

Neurotoxicity: The acute neurotoxicity of Iodomethane was evaluated in 12 male and 12 female rats per group exposed to 0, 25, 100 or 400 ppm Iodomethane via inhalation for 6 hours on a single day. Adverse effects on the nervous system were observed in the 100 and 400 ppm exposure group, but not in the 25 ppm exposure group. Effects included: repetitive movement of the mouth and jaws, drooping eyelids, increased salivation, abnormal gait, decreased arousal, uncoordinated air righting reflexes, decreased motor activity and no startle response (in the 400 ppm group). An increase in incidence and severity of adverse effects was evident with increasing dose between the 100ppm and 400 ppm exposed rats.

12. Ecological Information

Test	Route of Entry	Value/Critical Effects
Wildlife Toxicity	LD ₅₀ (oral) bobwhite quail	57 mg/kg
	LD ₅₀ (inhl;4-hr) bobwhite quail	392 ppm (>2 mg/L)
	LD ₅₀ (static renewal; 96-hr) rainbow trout	1.4 mg/L
	LD ₅₀ (static renewal; 48-hr) Daphnia	0.57 mg/L
Water	Hydrolysis Half-live @ 25°C , pH= 4	105 days
	Hydrolysis Half-live @ 25°C , pH= 7	94 days
	Hydrolysis Half-live @ 25°C , pH= 9	109 days

Terrestrial Fate: Dissipation/degradation in typical strawberry and tomato soils is very rapid; half-life is 5 days. The major degradate is methanol. Methyl iodide is not an ozone depletory.

Aquatic Fate: Under anaerobic aquatic conditions, the major route of dissipation is volatilization; half-life is 42 hours. It will not be expected to bioconcentrate in aquatic organisms.

13. Disposal Considerations

Dispose of in a manner consistent with federal, state and local regulations. This material is listed as an Underlying Hazardous Constituent (UHC) and U138 Waste Code according to RCRA.

14. Transport Information

SHIPPING CRITERIA	US DOT	IATA
Proper Shipping Name	Methyl Iodide	Forbidden
Hazard Class	Class 6.1	
Identification Number	UN 2644	
Packing Group	PG I	
Shipping Label	Toxic, Poison Inhalation Hazard, Zone B	
Additional Marking Requirement	Consult the 49CFR Non-Bulk and Bulk Requirements	

15. Regulatory Information

US Federal Regulations:

OSHA: This material is considered a Highly Hazardous Chemical under 29CFR 1910.119 Process Safety Management. This material has a Permissible Exposure Limit (PEL) - 5 ppm (skin).

EPA: Clean Air Act- This material is listed as a Hazardous Air Pollutant (HAP). This material does not contain any Class1 or 2 Ozone Depletors.
Clean Water Act- This material is not listed as a Hazardous Substance, Priority Pollutant or as a Toxic Pollutant.
TSCA- CAS# 74-88-4 is listed on the Public Inventory.
SARA Title III-
 Section 302: RQ= 100 Lbs
 Section 302: This product does not have a Threshold Planning Quantity (TPQ)
 Section 313: This material subject to reporting under 40 CFR Part 372, Toxic Release Inventory.

Individual Country Lists: This material can be found on the following country listings; Australia (AICS), Canada (WHMIS), EU (REACH), Japan (ENCS), Korea (ECL), Philippines(PICCS), New Zealand (NZIoC), SWISS (Giftliste 1), Taiwan (BSMI).

European Regulations

European Priority Lists Information (Council Regulation (EEC) 793/93):

This chemical substance is not listed in a priority list.

Classification and Labeling Information:

This chemical substance is not classified in the Annex I of Directive 67/548/EEC.

IUCLID & OECD Chemical Data Sheets and Export Files Information:

Not available for this substance

European Risk Assessment Information (Council Regulation (EEC) 793/93):

Not available for this substance

EU: EINECS#: 200-819-5

Hazard Symbol



Toxic (T)

Risk Description

R21	Harmful in contact with skin.
R25	Toxic if swallowed.
R36/37/38	Irritating to eyes, respiratory system and skin.

Safety Description

S26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S28A	After contact with skin, wash immediately with plenty of water.
S36/37/39	Wear suitable protective clothing, gloves and eye/face protection.
S45	In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

State Regulations: Each State and LEPC may promulgate standards more stringent than the federal government. This section cannot encompass an inclusive list of all state regulations. Therefore the user should consult state and local authorities.

16. Other Information

Users Responsibility: A bulletin such as this cannot be expected to cover all possible individual situations. As the user has the responsibility to provide a safe workplace, all aspects of an individual operation should be examined to determine if, or where, precautions are required. Any health hazard and safety information herein should be passed on to your customers or employees.

Disclaimer of Liability: The information contained herein is, to the best of our knowledge and belief, accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results and assume no liability for damages incurred by use of this material. All chemicals may present unknown health hazards are described herein, we cannot guarantee that these are the only hazards which exist. Final determination of suitability of the chemical is the sole responsibility of the user. No representations or warranties, either expressed or implied, of merchantability, fitness for a particular purpose or any other nature are made hereunder with respect to the information contained herein or the chemical to which the information refers. It is the responsibility of the user to comply with all applicable federal, state and local laws and regulations.

SDS Code: 160.04 GHS

Effective : 06/01/2015

Supercedes: 07/31/2012

For Technical or Regulatory Information contact:

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