# SAFETY DATA SHEET

Updated on 24/12/2024

## 1. Material Identification

**Product Name** : Resmethrin
**Catalog Number** : io-2963
**CAS Number** : 10453-86-8
**Identified uses** : Laboratory chemicals, manufacture of chemical compounds
**Company** : Ionz

**>> R&D Use only**

## 2. Hazards Identification

### GHS Classification:

Flammable liquid ( category 2 )
Acute toxicity, oral (Category 3)
Acute toxicity, dermal (Category 3)
Acute toxicity, inhalation (Category 3)
Specific target organ toxicity, single exposure (Category 1)

**Pictogram(s)**

>> Warning

**GHS Hazard Statements**

>> H302 (100%): Harmful if swallowed [Warning Acute toxicity, oral]

>> H400 (100%): Very toxic to aquatic life [Warning Hazardous to the aquatic environment, acute hazard]

>> H410 (100%): Very toxic to aquatic life with long lasting effects [Warning Hazardous to the aquatic environment, long-term hazard]

**Precautionary Statement Codes**

>> P264, P270, P273, P301+P317, P330, P391, and P501

### Health Hazards:

>> Excerpt from ERG Guide 171 [Substances (Low to Moderate Hazard)]:

>> Inhalation of material may be harmful. Contact may cause burns to skin and eyes. Inhalation of Asbestos dust may have a damaging effect on the lungs. Fire may produce irritating, corrosive and/or toxic gases. Some liquids produce vapors that may cause dizziness or asphyxiation. Runoff from fire control or dilution water may cause environmental contamination. (ERG, 2024)

>> Excerpt from ERG Guide 171 [Substances (Low to Moderate Hazard)]:

>> Some may burn but none ignite readily. Containers may explode when heated. Some may be transported hot. For UN3508, Capacitor, asymmetric, be aware of possible short circuiting as this product is transported in a charged state. Polymeric beads, expandable (UN2211) may evolve flammable vapours. (ERG, 2024)

>> Liquid formulations containing organic solvents may be flammable.

## 3. Composition/Information On Ingredients

**Chemical name** : Resmethrin
**CAS Number** : 10453-86-8
**Molecular Formula** : C22H26O3
**Molecular Weight** : 338.4000 g/mol

## 4. First Aid Measures

### First Aid:

>> Excerpt from ERG Guide 171 [Substances (Low to Moderate Hazard)]:

>> Refer to the "General First Aid" section. (ERG, 2024)

**First Aid Measures**

**Inhalation First Aid**

>> Fresh air, rest.

**Skin First Aid**

>> Remove contaminated clothes. Rinse and then wash skin with water and soap.

**Eye First Aid**

>> First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

**Ingestion First Aid**

>> Rinse mouth.

## 5. Fire Fighting Measures

>> Excerpt from ERG Guide 171 [Substances (Low to Moderate Hazard)]:

>> CAUTION: Fire involving Safety devices (UN3268) and Fire suppressant dispersing devices (UN3559) may have a delayed activation and a risk of hazardous projectiles. Extinguish the fire at a safe distance.

>> SMALL FIRE: Dry chemical, CO2, water spray or regular foam.

>> LARGE FIRE: Water spray, fog or regular foam. Do not scatter spilled material with high-pressure water streams. If it can be done safely, move undamaged containers away from the area around the fire. Dike runoff from fire control for later disposal.

>> FIRE INVOLVING TANKS: Cool containers with flooding quantities of water until well after fire is out. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. ALWAYS stay away from tanks in direct contact with flames. (ERG, 2024)

>> Use powder, AFFF, foam, carbon dioxide. In case of fire: keep drums, etc., cool by spraying with water.

## 6. Accidental Release Measures

### Isolation and Evacuation:

Isolation and evacuation measures to take when a large amount of this chemical is accidentally released in an emergency.

>> Excerpt from ERG Guide 171 [Substances (Low to Moderate Hazard)]:

>> IMMEDIATE PRECAUTIONARY MEASURE: Isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.

>> SPILL: Increase the immediate precautionary measure distance, in the downwind direction, as necessary.

>> FIRE: If tank, rail tank car or highway tank is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions. (ERG, 2024)

### Spillage Disposal:

Methods for containment and safety measures to protect workers dealing with a spillage of this chemical.

>> Do NOT wash away into sewer. Do NOT let this chemical enter the environment. Sweep spilled substance into covered containers. If appropriate, moisten first to prevent dusting. Carefully collect remainder. Then store and dispose of according to local regulations.

## 7. Handling And Storage

### Safe Storage:

>> Provision to contain effluent from fire extinguishing.

### Storage Conditions:

>> ... /Store/ under dry conditions.

## 8. Exposure Control/ Personal Protection

### Inhalation Risk:

>> No indication can be given about the rate at which a harmful concentration of this substance in the air is reached on evaporation at 20 °C.

### Effects of Short Term Exposure:

>> The substance is irritating to the eyes and skin.

### Acceptable Daily Intakes:

An estimate of the amount of a chemical in food or drinking water that can be consumed daily over a lifetime without presenting an appreciable risk to health. It is usually expressed as milligrams of the substance per kilogram of body weight per day and applies to chemicals such as food additives, pesticide residues and veterinary drugs.

>> EPA RfD= 0.03 mg/kg

**Fire Prevention**

>> NO open flames.

**Exposure Prevention**

>> PREVENT DISPERSION OF DUST!

**Inhalation Prevention**

>> Use ventilation (not if powder), local exhaust or breathing protection.

**Skin Prevention**

>> Protective gloves.

**Eye Prevention**

>> Wear safety goggles.

**Ingestion Prevention**

>> Do not eat, drink, or smoke during work. Wash hands before eating.

## 9. Physical And Chemical Properties

**Molecular Weight:**

>> 338.4

**Exact Mass:**

>> 338.18819469

**Physical Description:**

>> Resmethrin appears as colorless crystals or waxy solid. Insoluble in water. Used as an insecticide.

>> COLOURLESS WAXY SOLID IN VARIOUS FORMS WITH CHARACTERISTIC ODOUR.

**Color/Form:**

>> Waxy off-white to tan solid

**Odor:**

>> Chrysanthemate odor

**Boiling Point:**

>> Decomposes at >180 °C

**Melting Point:**

>> 56.5 °C (pure (1-RS)-trans isomer)

>> 43-48 °C

**Solubility:**

>> Very sol in xylene and aromatic petroleum hydrocarbons; solubility in kerosene 10%

>> Solubility in water: none

**Density:**

>> 0.958-0.968 at 20 °C

>> Relative density (water = 1): 0.96

**Vapor Pressure:**

>> 0.00000001 [mmHg]

>> Vapor pressure, Pa at 20 °C:

**LogP:**

>> log Kow = 5.43

>> 3.46

**Stability/Shelf Life:**

>> Stable to heat and to oxidation. Decomposes rapidly on exposure to air and light (more slowly than pyrethrins). Unstable in alkaline media.

**Decomposition:**

>> When heated to decomp it emits acrid and irritating fumes.

**Corrosivity:**

The ability of a chemical to damage or destroy other substances when it comes into contact.

>> Non-corrosive

**Refractive Index:**

>> Refractive index at 20 °C= 1.5287

## 10. Stability And Reactivity

>> Insoluble in water.

## 11. Toxicological Information

**Toxicity Summary:**

>> Both type I and type II pyrethroids exert their effect by prolonging the open phase of the sodium channel gates when a nerve cell is excited. They appear to bind to the membrane lipid phase in the immediate vicinity of the sodium channel, thus modifying the channel kinetics. This blocks the closing of the sodium gates in the nerves, and thus prolongs the return of the membrane potential to its resting state. The repetitive (sensory, motor) neuronal discharge and a prolonged negative afterpotential produces effects quite similar to those produced by DDT, leading to hyperactivity of the nervous system which can result in paralysis and/or death. Other mechanisms of action of pyrethroids include antagonism of gamma-aminobutyric acid (GABA)-mediated inhibition, modulation of nicotinic cholinergic transmission, enhancement of noradrenaline release, and actions on calcium ions. They also inhibit calium channels and Ca2+, Mg2+-ATPase. (T10, T18, L857)

**RAIS Toxicity Values:**

This section provides the Chemical toxicity information from the Risk Assessment Information System.

**Oral Chronic Reference Dose (RfDoc) (mg/kg-day)**

>> 0.03

**Oral Chronic Reference Dose Reference**

>> IRIS Current

**Oral Slope Factor (CSFo)(mg/kg-day)^-1**

>> 0.05621

**Oral Slope Factor Reference**

>> OPP

**EPA Human Health Benchmarks for Pesticides:**

This section provides the EPA human health benchmarks non-enforceable drinking water levels related to adverse health effects from drinking water exposure to contaminants that have no drinking water standards or health advisories.

**Chemical Substance**

>> Resmethrin

**Chronic or One Day PAD (RfD) [mg/kg/day]**

>> 0.035

**Chronic or One Day HHBPs [ppb]**

>> 210

**Chronic HHBP Sensitive Lifestage/Population**

>> General Population

**Cancer Quantification c (Q1) Values (CSF) [mg/kg/day]**

>> 0.05621

**Carcinogenic HHBP (E-6 to E-4 ) [ppb]**

>> 0.5263-52.63

**Reference (PDF)**

>> Human Health Benchmarks for Pesticides - 2021 Update

**Evidence for Carcinogenicity:**

Evidence that this chemical does or may cause cancer. The information here is collected from various sources by the Hazardous Substances Data Bank (HSDB).

>> Cancer Classification: Likely to be Carcinogenic to Humans

**Carcinogen Classification:**

This section provides the International Agency for Research on Cancer (IARC) Carcinogenic Classification and related monograph links. In the IARC Carcinogenic classification, chemicals are categorized into four groups: Group 1 (carcinogenic to humans), Group 2A (probably carcinogenic to humans), Group 2B (possibly carcinogenic to humans), and Group 3 (not classifiable as to its carcinogenicity to humans).

>> No indication of carcinogenicity to humans (not listed by IARC).

**Health Effects:**

>> Pyrethroid effects typically include rapid onset of aggressive behavior and increased sensitivity to external stimuli, followed by fine tremor, prostration with coarse whole body tremor, elevated body temperature, coma, and death. Paresthesia, severe corneal damage, hypotension and tachycardia, associated with anaphylaxis, can also occur following pyrethriod poisoning. (L857)

**Exposure Routes:**

>> The substance can be absorbed into the body by inhalation of its aerosol and by ingestion.

>> Inhalation (L857) ; oral (L857) ; dermal (L857) ; eye contact (L857).

**Skin Exposure**

>> Redness.

**Eye Exposure**

>> Redness.

>> Following oral exposure, severe fine tremor, marked reflex hyperexcitability, sympathetic activation can occur. Nausea, vomiting and abdominal pain commonly occur and develop following ingestion. Sudden bronchospasm, swelling of oral and laryngeal mucous membranes, and anaphylactoid reactions have been reported after inhalation. Hypersensitivity reactions characterized by pneumonitis, cough, dyspnea, wheezing, chest pain, irritability to sound and touch, and bronchospasm may occur too. Dermatitis is the main effect of a dermal exposure resmethrin. (T36)

**Target Organs:**

Organs that are affected by exposure to this chemical. Information in this section reflects human data unless otherwise noted.

>> Reproductive

**Adverse Effects:**

An adverse effect is an undesired harmful effect resulting from a medical treatment or other intervention.

>> Neurotoxin - Other CNS neurotoxin

**Toxicity Data:**

>> LC50 (rat) > 9,490 mg/m3/4h

**Treatment:**

Treatment when exposed to toxin

>> Following oral exposure, the treatment is symptomatic and supportive and includes monitoring for the development of hypersensitivity reactions with respiratory distress. Provide adequate airway management when needed. Gastric decontamination is usually not required unless the pyrethrin product is combined with a hydrocarbon. Following inhalation exposure, move patient to fresh air. monitor for respiratory distress. If cough or difficulty breathing develops, evaluate for respiratory tract irritation, bronchitis, or pneumonitis. Administer oxygen and assist ventilation as required. Treat bronchospasm with inhaled beta2 agonist and oral or parenteral corticosteroids. In case of eye exposure, irrigate exposed eyes with copious amounts of room temperature water for at least 15 minutes. If irritation, pain, swelling, lacrimation, or photophobia persist, the patient should be seen in a health care facility. If the contamination occurs through dermal exposure, Remove contaminated clothing and wash exposed area thoroughly with soap and water. A physician may need to examine the area if irritation or pain persists. Vitamin E topical application is highly effective in relieving parenthesis. (L363)

**Interactions:**

>> /Pyrethroid/ detoxification ... important in flies, may be delayed by the addition of synergists ... organophosphates or carbamates ... to guarantee a lethal effect. ... /Pyrethroid/

**Antidote and Emergency Treatment:**

>> Emergency and supportive measures: Treat bronchospasm and anaphylaxis if they occur. Observe patients with a history of large ingestions for at least 4-6 hours for any signs of CNS depression or seizures. /Pyrethrins and pyrethroids/

**Human Toxicity Excerpts:**

>> /HUMAN EXPOSURE STUDIES/ A dermal absorption estimate of 2.0% was selected based in part on a recent dermal absorption study of pyrethrins in humans that indicated 0.22% dermal absorption. In the /previous/ study with pyrethrins, the exposure period was 8 hours in four male volunteers. Subjects were monitored for 120 hours. Dermal penetration of 0.22% was calculated as the sum of urinary and fecal excretion. This study was further corroborated by other human dermal estimates with cypermethrin (0.3-1.8%) from which to estimate dermal penetration /Pyrethrins/.

**Non-Human Toxicity Excerpts:**

>> /LABORATORY ANIMALS: Acute Exposure/ In acute toxicity studies resmethrin in corn oil was administered intragastrically, 100 mg/kg body wt and 500 mg/kg body wt to DD strain mice and Sprague-Dawley (SD) rats, respectively. Hypersensitivity, tremors and ataxia /were observed/.

**Non-Human Toxicity Values:**

>> LD50 Rat oral 1400 mg/kg

**Populations at Special Risk:**

>> Chronic respiratory disease: In persons with chronic respiratory disease, especially asthma, the inhalation of /pyrethroids/ might cause exacerbation of symptoms due to its sensitizing properities. Skin disease: /Pyrethroids/ can cause dermatitis which may be allergic in nature. Persons with pre-existing skin disorders may be more susceptible to the effects of this agent. ... /Pyrethroids/

## 12. Ecological Information

**Resident Soil (mg/kg)**

>> 1.90e+03

**Industrial Soil (mg/kg)**

>> 2.50e+04

**Tapwater (ug/L)**

>> 6.70e+01

**MCL (ug/L)**

>> 2.00e-01

**Risk-based SSL (mg/kg)**

>> 4.20e+01

**Chronic Oral Reference Dose (mg/kg-day)**

>> 3.00e-02

**Volatile**

>> Volatile

**Mutagen**

>> Mutagen

**Fraction of Contaminant Absorbed in Gastrointestinal Tract**

>> 1

**Fraction of Contaminant Absorbed Dermally from Soil**

>> 0.1

### ICSC Environmental Data:

>> The substance is very toxic to aquatic organisms. This substance may be hazardous to the environment. Special attention should be given to bees. This substance does enter the environment under normal use. Great care, however, should be taken to avoid any additional release, for example through inappropriate disposal.

### Average Daily Intake:

The average amount of the compound taken into the body through eating, drinking, or breathing.

>> Using the Total Exposure Assessment Methodology (TEAM), air samples in residential households were collected over 24-hr periods in indoor, outdoor and personal air in two areas (Jacksonville, FL and Springfield/Chicopee, MA)(1); based upon air sample detections, the annual avg daily concn to resmethrin was estimated to be 0.1 ng/cu m in Jacksonville, FL(1); resmethrin was not detected in the MA area samplings(1).

## 13. Disposal Considerations

### Spillage Disposal

>> Do NOT wash away into sewer. Do NOT let this chemical enter the environment. Sweep spilled substance into covered containers. If appropriate, moisten first to prevent dusting. Carefully collect remainder. Then store and dispose of according to local regulations.

### Disposal Methods

>> SRP: The most favorable course of action is to use an alternative chemical product with less inherent propensity for occupational exposure or environmental contamination. Recycle any unused portion of the material for its approved use or return it to the manufacturer or supplier. Ultimate disposal of the chemical must consider: the material's impact on air quality; potential migration in soil or water; effects on animal, aquatic, and plant life; and conformance with environmental and public health regulations.

>> It could be ... buried in noncrop land away from water. In each of these cases it would be better to mix the product with lime. Incineration would be an effective disposal procedure where permitted. If an efficient incinerator is not available, the product should be mixed with large amt of combustible material. Recommendable methods: Hydrolysis, landfill, incineration, & open burning. Not recommendable method: Discharge to sewer. Peer-review: Mix with sawdust and burn at a remote place. (Peer-review conclusions of an IRPTC expert consultation (May 1985))

>> Incineration would be an effective disposal procedure where permitted. ... /Pyrethrin products/

>> Empty containers may be decontaminated by washing three times with detergent and water. Additionally, the container should be soaked overnight in 5% sodium hydroxide. Impermeable gantlets should be worn for all decontamination procedures. A deep soakage pit should be provided for the rinsings. Decontaminated containers must not be used for storage or transport of food or drink. Containers not decontaminated should be burned or crushed and buried below topsoil. Care must be taken to avoid contamination of water sources.

>> Disposal: Waste containing resmethrin should be burnt in a proper high-temperature incinerator with effluent scrubbing. Where no incinerator is available, contaminated absorbents or surplus products should be decomposed by hydrolysis at pH 12 or above. Contact with a suitable hydrolysing agent is required to ensure degradation of the active ingredient to a safe level. For emulsifiable material: 5% sodium hydroxide (caustic soda) solution or saturated (7-10%) sodium carbonate (washing soda) solution can be used. For non-emulsifiable material: use a 1:1 mixture (by volume) of either of the above solutions and a water/oil soluble solvent, such as denatured alcohol, monoethylene glycol, hexylene glycol, or isopropanol. Cover the material with the hydrolysing agent and put aside to stand for 7 days. Before disposal of the resultant waste, the material must be analysed to ensure that the active ingredient has been degraded to a safe level. Never pour untreated waste or surplus products into public sewers or anywhere where there is any danger of run-off or seepage into streams, watercourses, open waterways, ditches, fields with drainage systems, or the catchment areas of boreholes, wells, springs, or ponds.

## 14. Transport Information

### DOT

Resmethrin
6.1
UN Pack Group: III

### IATA

Resmethrin
6.1,
UN Pack Group: III

## 15. Regulatory Information

### Regulatory Information

### California Safe Cosmetics Program (CSCP) Reportable Ingredient

>> Hazard Traits - Carcinogenicity; Developmental Toxicity; Endocrine Toxicity; Environmental tox; Reproductive Toxicity

>> Authoritative List - CECBP - Priority Chemicals; CWA 303(d); Prop 65

>> Report - regardless of intended function of ingredient in the product

### Status Regulation (EC)

>> 2002/2076

## 16. Other Information

**Other Safety Information**

**Chemical Assessment**

>> IMAP assessments - Cyclopropanecarboxylic acid, 2,2-dimethyl-3-(2-methyl-1-propenyl)-, [5-(phenylmethyl)-3-furanyl]methyl ester, (1R-trans)-: Human health tier I assessment

>> IMAP assessments - Cyclopropanecarboxylic acid, 2,2-dimethyl-3-(2-methyl-1-propenyl)-, [5-(phenylmethyl)-3-furanyl]methyl ester, (1R-trans)-: Environment tier I assessment

**Chemical Assessment**

>> IMAP assessments - Cyclopropanecarboxylic acid, 2,2-dimethyl-3-(2-methyl-1-propenyl)-, [5-(phenylmethyl)-3-furanyl]methyl ester: Environment tier I assessment

>> IMAP assessments - Cyclopropanecarboxylic acid, 2,2-dimethyl-3-(2-methyl-1-propenyl)-, [5-(phenylmethyl)-3-furanyl]methyl ester: Human health tier I assessment

"The information provided is believed to be accurate but is not comprehensive and should be used as a reference. It reflects our current knowledge and is intended for safety guidance related to the product. This document does not constitute a warranty of the product's properties. Ionz is not responsible for any damages resulting from handling or contact with the product incorrectly."