

1. Material Identification

Product Name : Mecoprop

Catalog Number : io-2592

CAS Number : 93-65-2

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)



GHS Hazard Statements

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

>> H311 (97.5%): Toxic in contact with skin [Danger Acute toxicity, dermal]

>> H315 (100%): Causes skin irritation [Warning Skin corrosion/irritation]

>> H318 (100%): Causes serious eye damage [Danger Serious eye damage/eye irritation]

>> 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

>> P262, P264, P264+P265, P270, P273, P280, P301+P317, P302+P352, P305+P354+P338, P316, P317, P321, P330, P332+P317, P361+P364, P362+P364, P391, P405, and P501

Health Hazards:

>> Excerpt from ERG Guide 154 [Substances – Toxic and/or Corrosive (Non-Combustible)]:

>> TOXIC and/or CORROSIVE; inhalation, ingestion or skin contact with material may cause severe injury or death. Contact with molten substance may cause severe burns to skin and eyes. Avoid any skin contact. Fire may produce irritating, corrosive and/or toxic gases. Runoff from fire control or dilution water may be corrosive and/or toxic and cause environmental contamination. (ERG, 2024)

>> Excerpt from ERG Guide 154 [Substances – Toxic and/or Corrosive (Non-Combustible)]:

>> Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes. Some are oxidizers and may ignite combustibles (wood, paper, oil, clothing, etc.). Corrosives in contact with metals may evolve flammable hydrogen gas. Containers may explode when heated. For electric vehicles or equipment,

ERG Guide 147 (lithium ion or sodium ion batteries) or ERG Guide 138 (sodium batteries) should also be consulted. (ERG, 2024)

- >> Not combustible. Liquid formulations containing organic solvents may be flammable. Gives off irritating or toxic fumes (or gases) in a fire.

3. Composition/Information On Ingredients

Chemical name : Mecoprop
CAS Number : 93-65-2
Molecular Formula : C10H11ClO3
Molecular Weight : 214.6400 g/mol

4. First Aid Measures

First Aid:

- >> Excerpt from ERG Guide 154 [Substances – Toxic and/or Corrosive (Non-Combustible)]:
- >> Refer to the "General First Aid" section. Specific First Aid: For corrosives, in case of contact, immediately flush skin or eyes with running water for at least 30 minutes. Additional flushing may be required. (ERG, 2024)

First Aid Measures

Inhalation First Aid

- >> Fresh air, rest. Refer for medical attention.

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. Give a slurry of activated charcoal in water to drink. Refer for medical attention .

5. Fire Fighting Measures

- >> Excerpt from ERG Guide 154 [Substances – Toxic and/or Corrosive (Non-Combustible)]:
- >> SMALL FIRE: Dry chemical, CO2 or water spray.
- >> LARGE FIRE: Dry chemical, CO2, alcohol-resistant foam or water spray. 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, RAIL TANK CARS OR HIGHWAY TANKS: Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles. Do not get water inside containers. 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)
- >> In case of fire in the surroundings, use appropriate extinguishing media.

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 154 [Substances – Toxic and/or Corrosive (Non-Combustible)]:

- >> 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.

- >> Personal protection: particulate filter respirator adapted to the airborne concentration of the substance. Do NOT let this chemical enter the environment. Sweep spilled substance into covered plastic 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:

- >> Store in an area without drain or sewer access. Separated from food and feedstuffs.

Storage Conditions:

- >> Keep container tightly closed in a dry and well-ventilated place.

8. Exposure Control/ Personal Protection

Inhalation Risk:

- >> A harmful concentration of airborne particles can be reached quickly on spraying or when dispersed, especially if powdered.

Effects of Short Term Exposure:

- >> The substance is irritating to the eyes, skin and respiratory tract.

Exposure Prevention

- >> STRICT HYGIENE!

Inhalation Prevention

- >> Use 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:

- >> 214.64

Exact Mass:

- >> 214.0396719

Physical Description:

- >> Mecoprop appears as colorless crystals. Corrosive to metals. Used as an herbicide.
- >> COLOURLESS-TO-BROWN CRYSTALLINE POWDER.

Color/Form:

- >> Colorless crystals

Odor:

- >> Odorless

Melting Point:

- >> 93-95 °C
- >> 94 °C

Solubility:

- >> Solubility of its salts in water: diethanolamine 580, dimethylamine 660 (all in g/L, 20 °C) /Mecoprop salts/
- >> Solubility in water, g/100ml at 25 °C: 0.07

Density:

- >> 1.28 g/cm³

Vapor Pressure:

- >> 0.0000023 [mmHg]
- >> Vapor pressure, Pa at 22.5 °C: 0.08

LogP:

- >> log Kow = 3.13
- >> 1.17

Stability/Shelf Life:

- >> Stable under recommended storage conditions.

Decomposition:

- >> Hazardous decomposition products formed under fire conditions – Carbon oxides, hydrogen chloride gas.

Corrosivity:

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

- >> CORROSIVE TO METALS IN PRESENCE OF MOISTURE

Dissociation Constants:**Acidic pKa**

- >> 3.21
- >> pKa = 3.78

10. Stability And Reactivity

- >> Soluble in water.

11. Toxicological Information

Toxicity Summary:

- >> IDENTIFICATION AND USE: Mecoprop (MCP) is a solid. It is used as an herbicide. HUMAN STUDIES: In two cases of serious intoxication with MCP, both patients had central nervous system involvement, became unconscious and had an inadequate respiration. Muscle cramps and rhabdomyolysis with renal failure were noted in both. Shortly after admission both patients developed a serious decrease in arterial blood pressure (160/80 mmHg to 80/45 mmHg). In

one patient this was demonstrated to be caused by a reduction in peripheral vascular resistance. In another case, a patient who had ingested 500 mL of a mecoprop product died of hypotension and respiratory failure 36 hours after hospital admission. Two additional cases of MCPP ingestion followed a similar clinical course with rapid loss of consciousness, muscle cramps, and hypotension. Laboratory abnormalities included decreased platelets and hemoglobin and elevated creatine phosphokinase and myoglobin levels. One patient also developed acute renal failure secondary to rhabdomyolysis and required hemodialysis. In surviving patients, no long-term effects were reported. In male human blood lymphocytes, chromosomal aberrations were increased in the presence of activation at a cytotoxic dosing level of 2500 ug/mL. ANIMAL STUDIES: In rats, MCPP caused structural changes in spleen and thymus and changes of the number of blood lymphocytes and granulocytes. In a carcinogenicity study in mice, MCPP was administered in the diet at doses of 4, 40, and 592 mg/kg/day for males and 4, 46, and 732 mg/kg/day for females. In females, an increase in the incidence of chronic nephropathy and increased absolute and relative kidney weight were reported. There was no treatment related increase in tumor incidence compared to controls in this study. MCPP was given orally to mice at days 6–15 of pregnancy. It was embryotoxic at doses greater than or equal to 300 mg/kg and caused malformations of the skeleton at doses greater than or equal to 400 mg/kg. Salmonella typhimurium strains TA98, TA100, TA1535, and TA1537 were exposed in the presence and absence of activation to MCPP at concentrations of 0, 50, 150, 500, 1500, and 5000 ug/plate with incubation for 3 days with a repeat assay. An increase in the reversion frequency was not indicated. ECOTOXICITY STUDIES: MCPP injured shell formation with an increase of shell abnormalities following herbicide concentrations in two larval stages of marine mollusk Crassostrea gigas. However, the toxic concentrations were several orders of magnitude higher than environmental concentrations. MCPP was nontoxic to bees.

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).

- >> There is limited evidence of the carcinogenicity of chlorophenoxy herbicides (including mecoprop) to humans. There is no data for evaluation of the carcinogenicity of chlorophenoxy herbicides to animals. Overall evaluation: Group 2B: The agent is possibly carcinogenic to humans. /Chlorophenoxy herbicides/

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).

- >> 2B, possibly carcinogenic to humans. (L135)

Health Effects:

- >> Exposure to large amounts of CDDs causes chloracne, a severe skin disease with acne-like lesions that occur mainly on the face and upper body. CDDs may also cause liver damage and induce long-term alterations in glucose metabolism and subtle changes in hormonal levels. In addition, studies have shown that CDDs may disrupt the endocrine system and weaken the immune system, as well as cause reproductive damage and birth defects, central and peripheral nervous system pathology, thyroid disorders, endometriosis, and diabetes. 2,3,7,8-Tetrachlorodibenzo-p-dioxin is also a known human carcinogen. (L177, L178)

Exposure Routes:

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

Inhalation Exposure

- >> Burning sensation. Cough. Nausea.

Skin Exposure

- >> Redness.

Eye Exposure

- >> Redness. Pain.

Ingestion Exposure

- >> Abdominal pain. Headache. Nausea. Vomiting. Weakness. Unconsciousness.
- >> In addition to chloracne, CDD exposure causes skin rashes, discoloration, and excessive body hair. (L177)

Target Organs:

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

- >> Urinary

Adverse Effects:

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

- >> Occupational hepatotoxin – Secondary hepatotoxins: the potential for toxic effect in the occupational setting is based on cases of poisoning by human ingestion or animal experimentation.

Treatment:

Treatment when exposed to toxin

- >> Treatment may include washing any areas of contact, GI decontamination if swallowed, administering an IV and forced alkaline diuresis. (L346)

Interactions:

- >> /The authors/ investigated the developmental toxicity in mice of a commercial formulation of herbicide containing a mixture of 2,4-dichlorophenoxyacetic acid, mecoprop, dicamba and inert ingredients. Pregnant mice were exposed to one of four different doses of the herbicide mixture diluted in their drinking water, either during preimplantation and organogenesis or only during organogenesis. Litter size, birth weight and crown-rump length were determined at birth. Dams were sacrificed by carbon dioxide asphyxiation and the number of implantation sites was determined by staining with ammonium sulfide. The data, although apparently influenced by season, showed an inverted or u-shaped dose response pattern for reduced litter size, with the lowest dose – which corresponds to the reference dose for 2,4-D – producing the greatest decrease in the number of embryos implanted and number of pups being born. Fetotoxicity, as evidenced by a decrease in weight and crown-rump length of the newborn pups was not significantly different in herbicide-treated litters.

Antidote and Emergency Treatment:

- >> Immediate first aid: Ensure that adequate decontamination has been carried out. If patient is not breathing, start artificial respiration, preferably with a demand-valve resuscitator, bag-valve-mask device, or pocket mask, as trained. Perform CPR if necessary. Immediately flush contaminated eyes with gently flowing water. Do not induce vomiting. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway and prevent aspiration. Keep patient quiet and maintain normal body temperature. Obtain medical attention. /Chlorophenoxy Herbicides and Related Compounds/

Human Toxicity Excerpts:

- >> /CASE REPORTS/ A suicidal poisoning committed by a 61-year-old woman, who ingested an unknown quantity of Killex, containing in aqueous solution 100 g/L of (2,4-dichlorophenoxy)acetic acid (2,4-D), 50 g/L of mecoprop, and 9 g/L of dicamba as amine salts is described. Quantitation of chlorophenoxy acids was performed by extraction from an acidified mixture and concentration before high performance liquid chromatography analysis. All three herbicides were separated in a phosphate buffer/acetonitrile mixture at 280 nm on a RP-8 column. Concentrations of herbicides found were: in blood--520-mg/L 2,4-D, 530-mg/L mecoprop, and 170-mg/L dicamba; in urine--670-mg/L 2,4-D and 520-mg/L mecoprop; in bile--340-mg/L 2,4-D, 530-mg/L mecoprop, and 140-mg/L dicamba; and in liver--540-mg/Kg 2,4-D, 500-mg/Kg mecoprop, and less than 100-mg/Kg dicamba. Liquid chromatography was found to be a reliable method for herbicide quantitation in biological tissues and fluids. The technique offered definite advantages over ultraviolet spectrophotometry and avoids the derivatization requirement for gas chromatography.

Non-Human Toxicity Excerpts:

- >> /LABORATORY ANIMALS: Subchronic or Prechronic Exposure/ /In a/ 90-day feeding study in rats, /MCPD was given at concentrations of/ 0, 50, 150, /and/ 450 ppm (0, 4, 12, 37 mg/kg/day for males; 0, 5, 14, 41 mg/kg/day for females). NOAEL = 12 mg/kg/day; LOAEL = 37 mg/kg/day /based on/ increased absolute and/or relative kidney wt.

Non-Human Toxicity Values:

- >> LD50 Rabbit dermal 900 mg/kg

12. Ecological Information

Resident Soil (mg/kg)

- >> 6.30e+01

Industrial Soil (mg/kg)

- >> 8.20e+02

Tapwater (ug/L)

- >> 1.60e+01

MCL (ug/L)

- >> 1.50e+01

Risk-based SSL (mg/kg)

>> 4.70e-03

Chronic Oral Reference Dose (mg/kg-day)

>> 1.00e-03

Volatile

>> Volatile

Mutagen

>> Mutagen

Fraction of Contaminant Absorbed in Gastrointestinal Tract

>> 1

Fraction of Contaminant Absorbed Dermal from Soil

>> 0.1

ICSC Environmental Data:

>> The substance is harmful to aquatic organisms. 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.

Sediment/Soil Concentrations:

Concentrations of this compound in sediment/soil.

>> SEDIMENT: The concentration of mecoprop was determined in sediments of 5 salt marsh sites on the Essex, UK coast and ranged from <0.2 to 138.9 ng/g(1).

13. Disposal Considerations

Spillage Disposal

>> Personal protection: particulate filter respirator adapted to the airborne concentration of the substance. Do NOT let this chemical enter the environment. Sweep spilled substance into covered plastic containers. If appropriate, moisten first to prevent dusting. Carefully collect remainder. Then store and dispose of according to local regulations.

Disposal Methods

>> SRP: 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 air, soil or water; effects on animal, aquatic and plant life; and conformance with environmental and public health regulations. If it is possible or reasonable use an alternative chemical product with less inherent propensity for occupational harm/injury/toxicity or environmental contamination.

>> Product: Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber; Contaminated packaging: Dispose of as unused product.

>> Dispose of by special means (suitable incineration, etc.) in accordance with local regulations. /Mecoprop-P/

14. Transport Information

DOT

Mecoprop

6.1

UN Pack Group: III

IATA

Mecoprop

6.1,

15. Regulatory Information

Regulatory Information

Status Regulation (EC)

>> 03/70/EC, Reg (EU) 2015/408, Reg. (EU) 2022/801, Reg. (EU) No 540/2011, Reg. (EU) No 823/2012

REACH Registered Substance

>> Status: Active Update: 21-04-2023 <https://echa.europa.eu/registration-dossier/-/registered-dossier/19807>

New Zealand EPA Inventory of Chemical Status

>> Mecoprop: HSNO Approval: HSR003312 Approved with controls

16. Other Information

Toxic Combustion Products:

Toxic products (e.g., gases and vapors) produced from the combustion of this chemical.

>> Gives off irritating or toxic fumes (or gases) in a fire.

Other Safety Information

Chemical Assessment

>> IMAP assessments – Propanoic acid, 2-(4-chloro-2-methylphenoxy)-: Environment tier I assessment

>> IMAP assessments – Propanoic acid, 2-(4-chloro-2-methylphenoxy)-: Human health tier I assessment

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