

MATERIAL SAFETY DATA SHEET

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Version 1.12

Section 1 - Product and Company Information

Product Name ACRYLAMIDE, 97%
Product Number 148571
Brand ALDRICH

Company Sigma-Aldrich
Address 3050 Spruce Street
 SAINT LOUIS MO 63103 US

Technical Phone: 800-325-5832
Fax: 800-325-5052
Emergency Phone: 314-776-6555

Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313
ACRYLAMIDE	79-06-1	Yes

Formula C3H5NO
Synonyms Acrylamide (ACGIH:OSHA) * Acrylic amide *
 Akrylamid (Czech) * Amid kyseliny akrylove
 (Czech) * Ethylenecarboxamide * Propenamide *
 2-Propenamide (9CI) * Propenoic acid amide * RCRA
 waste number U007 * Vinyl amide

RTECS Number: AS3325000

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Toxic.

May cause cancer. May cause heritable genetic damage. Harmful by inhalation. Also toxic in contact with skin and if swallowed. Irritating to eyes and skin. May cause sensitization by inhalation and skin contact. Toxic: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed. Possible risk of impaired fertility. Readily absorbed through skin. Target organ(s): Nerves. Kidneys. Calif. Prop. 65 carcinogen.

HMIS RATING

HEALTH: 3*
FLAMMABILITY: 0
REACTIVITY: 1

NFPA RATING

HEALTH: 3
FLAMMABILITY: 0
REACTIVITY: 1

*additional chronic hazards present.

For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures

ORAL EXPOSURE

If swallowed, wash out mouth with water provided person is conscious. Call a physician immediately.

INHALATION EXPOSURE

If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

DERMAL EXPOSURE

In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

EYE EXPOSURE

In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

Section 5 - Fire Fighting Measures

EXPLOSION HAZARDS

Container explosion may occur under fire conditions.

FLASH POINT

280 °F 138 °C Method: closed cup

AUTOIGNITION TEMP

424 °C

FLAMMABILITY

N/A

EXTINGUISHING MEDIA

Suitable: Carbon dioxide, dry chemical powder, or appropriate foam.

FIREFIGHTING

Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
Specific Hazard(s): Emits toxic fumes under fire conditions.

Section 6 - Accidental Release Measures

PROCEDURE TO BE FOLLOWED IN CASE OF LEAK OR SPILL

Evacuate area.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP

Sweep up, place in a bag and hold for waste disposal. Avoid raising dust. Ventilate area and wash spill site after material pickup is complete.

Section 7 - Handling and Storage

HANDLING

User Exposure: Do not breathe dust. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

STORAGE

Suitable: Keep tightly closed.

SPECIAL REQUIREMENTS

Light sensitive.

Section 8 - Exposure Controls / PPE

ENGINEERING CONTROLS

Use only in a chemical fume hood. Safety shower and eye bath.

PERSONAL PROTECTIVE EQUIPMENT

Respiratory: Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N99 (US) or type P2 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator.

Hand: Compatible chemical-resistant gloves.

Eye: Chemical safety goggles.

GENERAL HYGIENE MEASURES

Wash contaminated clothing before reuse. Wash thoroughly after handling.

EXPOSURE LIMITS

Country	Source	Type	Value
Poland		NDS	0.1 MG/M3
Poland		NDSCh	-
Poland		NDSP	-

Section 9 - Physical/Chemical Properties

Appearance	Physical State: Solid	
Property	Value	At Temperature or Pressure
Molecular Weight	71.08 AMU	
pH	5.2 - 6.0	Concentration: 500 g/l
BP/BP Range	125 °C	25 mmHg
MP/MP Range	84 °C	
Freezing Point	N/A	
Vapor Pressure	1.6 mmHg	84.5 °C
Vapor Density	2.45 g/l	
Saturated Vapor Conc.	N/A	
SG/Density	N/A	
Bulk Density	N/A	
Odor Threshold	N/A	
Volatile%	N/A	
VOC Content	N/A	
Water Content	N/A	
Solvent Content	N/A	
Evaporation Rate	N/A	
Viscosity	N/A	
Surface Tension	N/A	
Partition Coefficient	Log Kow: - 0.670	
Decomposition Temp.	N/A	
Flash Point	280 °F 138 °C	Method: closed cup
Explosion Limits	N/A	
Flammability	N/A	

Autoignition Temp 424 °C
Refractive Index N/A
Optical Rotation N/A
Miscellaneous Data N/A
Solubility Solubility in Water:clear, colorless 0.2
 g/ml H2O, 20°C

N/A = not available

Section 10 - Stability and Reactivity

STABILITY

Stable: Stable.
Conditions to Avoid: Air. Light. Heat.
Materials to Avoid: Avoid contact with acid., Oxidizing agents
Iron and iron salts., Copper, Brass, Free radical initiators

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide,
Ammonia.

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: May occur
Hazardous Polymerization Reactions: May polymerize on exposure to
light. May polymerize on exposure to heat.

Section 11 - Toxicological Information

ROUTE OF EXPOSURE

Skin Contact: Causes skin irritation.
Skin Absorption: Readily absorbed through skin. Toxic if
absorbed through skin.
Eye Contact: Causes eye irritation.
Inhalation: Material may be irritating to mucous membranes and
upper respiratory tract. Harmful if inhaled.
Ingestion: Toxic if swallowed.

SENSITIZATION

Sensitization: Sensitizer.
Skin: May cause allergic skin reaction.

TARGET ORGAN(S) OR SYSTEM(S)

Nerves. Kidneys.

SIGNS AND SYMPTOMS OF EXPOSURE

Acrylamide toxicity is manifested as a sensorimotor peripheral
neuropathy. Symptoms include: drowsiness, loss of balance,
confusion, memory loss, hallucinations, numbness, paresthesias
(ataxia, tremor, dysarthria), and incoordination.

TOXICITY DATA

Inhalation
Rat
> 1,500 mg/m³
LC50

Oral
Rat
124 mg/kg
LD50

Skin

Rat
400 mg/kg
LD50

Remarks: Biochemical:Enzyme inhibition, induction, or change in blood or tissue levels: Peptidases. Biochemical:Enzyme inhibition, induction, or change in blood or tissue levels: Transaminases. Blood:Other changes.

Intraperitoneal
Rat
90 MG/KG
LD50

Oral
Mouse
107 mg/kg
LD50

Intraperitoneal
Mouse
170 MG/KG
LD50

Oral
Rabbit
150 mg/kg
LD50

Skin
Rabbit
1680 UL/KG
LD50

Remarks: Behavioral:Hallucinations, distorted perceptions.

Oral
Guinea pig
150 mg/kg
LD50

Subcutaneous
Guinea pig
170 MG/KG
LD50

Remarks: Behavioral:Tremor. Behavioral:Muscle contraction or spasticity. Gastrointestinal:Nausea or vomiting.

Oral
Quail
186 mg/kg
LD50

Remarks: Peripheral Nerve and Sensation:Flaccid paralysis without anesthesia (usually neuromuscular blockage). Behavioral:Altered sleep time (including change in righting reflex). Behavioral:Change in motor activity (specific assay).

Oral
Mammal
100 mg/kg
LD50

IRRITATION DATA
Skin

Remarks: Moderate irritation effect

Skin
Rabbit
50 mg
3D

Remarks: Mild irritation effect

Skin
Rabbit
500 mg
24H

Remarks: Mild irritation effect

Eyes
Rabbit
10 mg
30S

Remarks: Rinsed

Eyes
Rabbit
100 mg
24H

Remarks: Moderate irritation effect

CHRONIC EXPOSURE - CARCINOGEN

Result: This product is or contains a component that has been reported to be probably carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.

Species: Rat
Route of Application: Oral
Dose: 1456 MG/KG
Exposure Time: 2Y
Frequency: C
Result: Tumorigenic Effects: Testicular tumors.
Tumorigenic: Carcinogenic by RTECS criteria.

Species: Mouse
Route of Application: Intraperitoneal
Dose: 24 MG/KG
Exposure Time: 8W
Frequency: I
Result: Lungs, Thorax, or Respiration: Tumors.
Tumorigenic: Neoplastic by RTECS criteria.

Species: Mouse
Route of Application: Oral
Dose: 300 MG/KG
Exposure Time: 2W
Frequency: I
Result: Skin and Appendages: Other: Tumors. Lungs, Thorax, or Respiration: Tumors. Tumorigenic: Carcinogenic by RTECS criteria.

Species: Mouse
Route of Application: Intraperitoneal
Dose: 72 MG/KG
Exposure Time: 8W
Frequency: I
Result: Tumorigenic: Neoplastic by RTECS criteria. Lungs, Thorax, or Respiration: Tumors.

Species: Rat
Route of Application: Oral
Dose: 1456 MG/KG
Exposure Time: 2Y
Frequency: C
Result: Tumorigenic Effects: Uterine tumors
Tumorigenic: Carcinogenic by RTECS criteria.

Species: Rat
Route of Application: Oral
Dose: 1460 MG/KG
Exposure Time: 2Y
Frequency: C
Result: Skin and Appendages: Other: Tumors. Brain and
Coverings: Tumors. Tumorigenic: Carcinogenic by RTECS criteria.

IARC CARCINOGEN LIST

Rating: Group 2A

NTP CARCINOGEN LIST

Rating: Anticipated to be a carcinogen.

CHRONIC EXPOSURE - TERATOGEN

Species: Rat
Dose: 400 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (8D MALE)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death,
e.g., stunted fetus). Effects on Newborn: Behavioral.

Species: Mouse
Dose: 225 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (10-12D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death,
e.g., stunted fetus). Specific Developmental Abnormalities:
Musculoskeletal system.

Species: Mouse
Dose: 125 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (1D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death,
e.g., stunted fetus).

Species: Mouse
Dose: 300 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (8-10D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death,
e.g., stunted fetus).

Species: Mammal
Dose: 75 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (12D PREG)
Result: Specific Developmental Abnormalities: Musculoskeletal
system.

CHRONIC EXPOSURE - MUTAGEN

Result: May alter genetic material.

Species: Human
Dose: 1 MMOL/L
Cell Type: mammary gland
Mutation test: Unscheduled DNA synthesis

Species: Rat
Route: Intraperitoneal
Dose: 100 MG/KG
Mutation test: Micronucleus test

Species: Rat
Route: Oral
Dose: 150 MG/KG
Exposure Time: 5D
Mutation test: Unscheduled DNA synthesis

Species: Rat
Dose: 1 MMOL/L
Cell Type: Other cell types
Mutation test: DNA inhibition

Species: Rat
Route: Oral
Dose: 600 MG/KG
Exposure Time: 10D
Mutation test: Sister chromatid exchange

Species: Rat
Route: Oral
Dose: 150 MG/KG
Exposure Time: 5D
Mutation test: Dominant lethal test

Species: Mouse
Route: Intraperitoneal
Dose: 50 MG/KG
Mutation test: Micronucleus test

Species: Mouse
Dose: 300 MG/L (+S9)
Cell Type: lymphocyte
Mutation test: Mutation in microorganisms

Species: Mouse
Route: Intraperitoneal
Dose: 50 MG/KG
Mutation test: specific locus test

Species: Mouse
Dose: 12500 UG/L
Cell Type: fibroblast
Mutation test: Morphological transformation.

Species: Mouse
Dose: 25 MG/L
Cell Type: Embryo
Mutation test: Morphological transformation.

Species: Mouse
Route: Intraperitoneal
Dose: 100 MG/KG
Mutation test: DNA damage

Species: Mouse
Route: Intraperitoneal
Dose: 62500 UG/KG
Mutation test: Unscheduled DNA synthesis

Species: Mouse
Route: Oral
Dose: 500 PPM
Exposure Time: 2W
Mutation test: Cytogenetic analysis

Species: Mouse
Dose: 750 MG/L
Cell Type: lymphocyte
Mutation test: Cytogenetic analysis

Species: Mouse
Route: Intraperitoneal
Dose: 100 MG/KG
Mutation test: Cytogenetic analysis

Species: Mouse
Route: Intraperitoneal
Dose: 125 UG/KG
Mutation test: Sister chromatid exchange

Species: Mouse
Route: Intraperitoneal
Dose: 120 MG/KG
Mutation test: SLN

Species: Mouse
Route: Intraperitoneal
Dose: 125 MG/KG
Mutation test: Dominant lethal test

Species: Mouse
Route: Oral
Dose: 840 MG/KG
Exposure Time: 20W
Mutation test: Dominant lethal test

Species: Mouse
Dose: 500 MG/L
Cell Type: lymphocyte
Mutation test: Mutation in mammalian somatic cells.

Species: Mouse
Route: Intraperitoneal
Dose: 100 MG/KG
Mutation test: sperm

Species: Mouse
Route: Oral
Dose: 96634 UG/KG
Exposure Time: 4W
Mutation test: sperm

Species: Mouse
Route: Intraperitoneal
Dose: 50 MG/KG
Mutation test: Heritable translocation test

Species: Hamster
Dose: 150 MG/L
Cell Type: lung
Mutation test: Cytogenetic analysis

Species: Hamster
Dose: 500 MG/L
Cell Type: fibroblast
Mutation test: Cytogenetic analysis

Species: Hamster
Dose: 300 MG/L
Cell Type: lung
Mutation test: Sister chromatid exchange

Species: Hamster
Dose: 500 MG/L
Cell Type: lung
Mutation test: SLN

CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Result: May cause reproductive disorders.

Species: Rat
Dose: 200 MG/KG
Route of Application: Oral
Exposure Time: (7-16D PREG)
Result: Effects on Newborn: Biochemical and metabolic.

Species: Rat
Dose: 560 MG/KG
Route of Application: Oral
Exposure Time: (6-21D PREG/10D POST)
Result: Maternal Effects: Parturition. Effects on Newborn: Stillbirth. Effects on Newborn: Viability index (e.g., # alive at day 4 per # born alive).

Species: Rat
Dose: 75 MG/KG
Route of Application: Oral
Exposure Time: (5D MALE)
Result: Effects on Fertility: Male fertility index (e.g., # males impregnating females per # males exposed to fertile nonpregnant females).

Species: Rat
Dose: 140 MG/KG
Route of Application: Oral
Exposure Time: (2W PRE-3W POST)
Result: Effects on Newborn: Growth statistics (e.g., reduced weight gain).

Species: Rat
Dose: 150 MG/KG
Route of Application: Oral
Exposure Time: (5D MALE)

Result: Effects on Fertility: Pre-implantation mortality (e.g., reduction in number of implants per female; total number of implants per corpora lutea). Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Rat

Dose: 350 MG/KG

Route of Application: Intraperitoneal

Exposure Time: (7D MALE)

Result: Paternal Effects: Spermatogenesis (including genetic material, sperm morphology, motility, and count).

Species: Mouse

Dose: 571 MG/KG

Route of Application: Oral

Exposure Time: (16D MALE)

Result: Paternal Effects: Testes, epididymis, sperm duct.

Species: Mouse

Dose: 95 GM/KG

Route of Application: Oral

Exposure Time: (4W MALE)

Result: Paternal Effects: Spermatogenesis (including genetic material, sperm morphology, motility, and count). Effects on Fertility: Male fertility index (e.g., # males impregnating females per # males exposed to fertile nonpregnant females). Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Mouse

Dose: 95 GM/KG

Route of Application: Oral

Exposure Time: (4W PRE)

Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Mouse

Dose: 71 GM/KG

Route of Application: Oral

Exposure Time: (4W MALE)

Result: Effects on Fertility: Litter size (e.g.; # fetuses per litter; measured before birth).

Species: Mouse

Dose: 250 MG/KG

Route of Application: Intraperitoneal

Exposure Time: (5D MALE)

Result: Effects on Fertility: Male fertility index (e.g., # males impregnating females per # males exposed to fertile nonpregnant females). Effects on Fertility: Pre-implantation mortality (e.g., reduction in number of implants per female; total number of implants per corpora lutea). Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Mammal

Dose: 225 MG/KG

Route of Application: Intraperitoneal

Exposure Time: (10-12D PREG)

Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Effects on Embryo or Fetus: Fetal death.

Section 12 - Ecological Information

ACUTE ECOTOXICITY TESTS

Test Type: LC50 Fish
Species: Lepomis macrochirus (Bluegill)
Time: 96 h
Value: 100 mg/l

Test Type: LC50 Fish
Species: Onchorhynchus mykiss (Rainbow trout)
Time: 96 h
Value: 180 mg/l

Test Type: LC50 Fish
Species: Pimephales promelas (Fathead minnow)
Time: 96 h
Value: 90 mg/l

Test Type: EC50 Daphnia
Species: Daphnia magna
Time: 48 h
Value: 160 mg/l

Test Type: LC50 Fish
Species: Carassius auratus (Goldfish)
Time: 96 h
Value: 160 mg/l

Section 13 - Disposal Considerations

APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION

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. Observe all federal, state, and local environmental regulations.

Section 14 - Transport Information

DOT

Proper Shipping Name: Acrylamide
UN#: 2074
Class: 6.1
Packing Group: Packing Group III
Hazard Label: Toxic Substance
PIH: Not PIH

IATA

Proper Shipping Name: Acrylamide
IATA UN Number: 2074
Hazard Class: 6.1
Packing Group: III

Section 15 - Regulatory Information

EU DIRECTIVES CLASSIFICATION

Symbol of Danger: T
Indication of Danger: Toxic.

R: 45-46-20/21-25-36/38-43-48/23/24/25-62

Risk Statements: May cause cancer. May cause heritable genetic damage. Also harmful by inhalation and in contact with skin. Also toxic if swallowed. Irritating to eyes and skin. May cause sensitization by skin contact. Also toxic: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed. Possible risk of impaired fertility.

S: 53-45

Safety Statements: Restricted to professional users. Attention - Avoid exposure - obtain special instructions before use. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

US CLASSIFICATION AND LABEL TEXT

Indication of Danger: Toxic.

Risk Statements: May cause cancer. May cause heritable genetic damage. Harmful by inhalation. Also toxic in contact with skin and if swallowed. Irritating to eyes and skin. May cause sensitization by inhalation and skin contact. Toxic: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed. Possible risk of impaired fertility.

Safety Statements: Restricted to professional users. Attention - Avoid exposure - obtain special instructions before use. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Do not breathe dust. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing and gloves.

US Statements: Readily absorbed through skin. Target organ(s): Nerves. Kidneys. Calif. Prop. 65 carcinogen.

UNITED STATES REGULATORY INFORMATION

SARA LISTED: Yes

DEMINIMIS: 0.1 %

NOTES: This product is subject to SARA section 313 reporting requirements.

TSCA INVENTORY ITEM: Yes

UNITED STATES - STATE REGULATORY INFORMATION

CALIFORNIA PROP - 65

California Prop - 65: This product is or contains chemical(s) known to the state of California to cause cancer. This product is or contains chemical(s) known to the state of California to cause cancer.

CANADA REGULATORY INFORMATION

WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.

DSL: Yes

NDSL: No

Section 16 - Other Information

DISCLAIMER

For R&D use only. Not for drug, household or other uses.

WARRANTY

The above information is believed to be correct but does not

purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2007 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.