Material Safety Data Sheet

Date Printed: 19/OCT/2004
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Version 1.7
According to 91/155/EEC

Classified as Hazardous according to the criteria of EU Annex 1 and NOHSC.

1 - Product and Company Information

Product Name	ACRYLAMIDE
Product Number	23701
Company	Sigma-Aldrich Pty, Ltd Unit 2, 14 Anella Avenue Castle Hill NSW 1765 Australia
Technical Phone #	+61 2 9841 0555
Fax	+61 2 9841 0500
Emergency Phone #	+61 2 9841 0566

2 - Composition/Information on Ingredients

Product Name	CAS #	EC no	Annex I Index Number
ACRYLAMIDE	79-06-1	201-173-7	616-003-00-0

Formula	C3H5NO
Molecular Weight	71.08 AMU
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

3 - Hazards Identification

SPECIAL INDICATION OF HAZARDS TO HUMANS AND THE ENVIRONMENT

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.
Carc. Cat.2 Muta. Cat.2

4 - First Aid Measures

AFTER INHALATION

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

AFTER SKIN CONTACT

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

AFTER EYE CONTACT
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.

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

5 - Fire Fighting Measures

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

SPECIAL RISKS
Specific Hazard(s): Emits toxic fumes under fire conditions.
Explosion Hazards: Container explosion may occur under fire conditions.

SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS
Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

6 - Accidental Release Measures

PERSONAL PRECAUTION PROCEDURES 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.

7 - Handling and Storage

HANDLING
Directions for Safe Handling: Do not breathe dust. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

STORAGE
Conditions of Storage: Keep tightly closed.

SPECIAL REQUIREMENTS: Light sensitive.

8 - Exposure Controls / Personal Protection

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

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	-

EXPOSURE LIMITS - DENMARK

Source	Type	Value
OEL	TWA	0.03 mg/m3

Remarks: HK

EXPOSURE LIMITS - GERMANY

Source	Type	Value
TRGS 900	OEL	0.06 mg/m3

Remarks: 4
Remarks: H,TRK,7,29,TRGS 901-25

EXPOSURE LIMITS - NORWAY

Source	Type	Value
	OEL	0.03 mg/m3

Remarks: HKM

EXPOSURE LIMITS - SWITZERLAND

Source	Type	Value
OEL	OEL	0.03 mg/m3

Remarks: E H K

EXPOSURE LIMITS - UNITED KINGDOM

Source	Type	Value
OEL	OEL	0.3 mg/m3

PERSONAL PROTECTIVE EQUIPMENT
Respiratory Protection: Government approved respirator.
Hand Protection: Compatible chemical-resistant gloves.
Eye Protection: Chemical safety goggles.

9 - Physical and Chemical Properties

Appearance: Physical State: Solid

Property	Value	At Temperature or Pressure
pH	5.2 - 6	Concentration: 500 g/l
BP/BP Range	125 °C	25 mmHg
MP/MP Range	84 °C	
Flash Point	138 °C	Method: closed cup
Flammability	N/A	
Autoignition Temp	424 °C	
Oxidizing Properties	N/A	
Explosive Properties	N/A	
Explosion Limits	N/A	
Vapor Pressure	1.6 mmHg	84.5 °C
Partition Coefficient	Log Kow: -0.67	
Viscosity	N/A	
Vapor Density	2.45 g/l	
Saturated Vapor Conc.	N/A	
Evaporation Rate	N/A	
Bulk Density	N/A	
Decomposition Temp.	N/A	
Solvent Content	N/A	
Water Content	N/A	
Surface Tension	N/A	
Conductivity	N/A	
Miscellaneous Data	N/A	
Solubility	Solubility in Water:0.2 g/ml H2O, 20°C clear, colorless	

10 - Stability and Reactivity

STABILITY
Stable: Stable.
Conditions to Avoid: Sensitive to air. Sensitive to light.
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.

11 - Toxicological Information

RTECS NUMBER: AS3325000

ACUTE TOXICITY
LC50
Inhalation
Rat
> 1,500 mg/m3
4 H

LD50
Oral
Rat
124 mg/kg

LD50
Skin
Rat
400 mg/kg
Remarks: Blood:Other changes. Biochemical:Enzyme inhibition, induction, or change in blood or tissue levels: Transaminases. Biochemical:Enzyme inhibition, induction, or change in blood or tissue levels: Peptidases.

LD50
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
Remarks: Behavioral:Hallucinations, distorted perceptions.

LD50
Oral
Guinea pig
150 mg/kg

LD50
Subcutaneous
Guinea pig
170 MG/KG
Remarks: Behavioral:Tremor. Behavioral:Muscle contraction or spasticity. Gastrointestinal:Nausea or vomiting.

LD50
Oral
Quail
186 mg/kg
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).

LD50
Oral
Mammal
100 mg/kg

IRRITATION DATA

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

SENSITIZATION
Respiratory: May cause allergic respiratory reaction.
Skin: May cause allergic skin reaction.

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.

ROUTE OF EXPOSURE

Skin Contact: Causes skin irritation.
Skin Absorption: Toxic if absorbed through skin. Readily 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.

TARGET ORGAN INFORMATION

Nerves. Kidneys.

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.

Rat
Route of Application: Oral
Exposure Time: 2Y
Result: Tumorigenic:Carcinogenic by RTECS criteria. Tumorigenic Effects: Testicular tumors.

Mouse
Route of Application: Intraperitoneal
Exposure Time: 8W
Result: Tumorigenic:Neoplastic by RTECS criteria. Lungs, Thorax, or Respiration:Tumors.

Mouse
Route of Application: Oral
Exposure Time: 2W
Result: Tumorigenic:Carcinogenic by RTECS criteria. Lungs, Thorax, or Respiration:Tumors. Skin and Appendages: Other: Tumors.

Mouse
Route of Application: Intraperitoneal
Exposure Time: 8W
Result: Tumorigenic:Neoplastic by RTECS criteria. Lungs, Thorax, or Respiration:Tumors.

Rat
Route of Application: Oral
Exposure Time: 2Y
Result: Tumorigenic:Carcinogenic by RTECS criteria. Tumorigenic Effects: Uterine tumors

Rat
Route of Application: Oral
Exposure Time: 2Y
Result: Tumorigenic:Carcinogenic by RTECS criteria. Brain and Coverings:Tumors. Skin and Appendages: Other: Tumors.

IARC CARCINOGEN LIST

Rating: Group 2A

CHRONIC EXPOSURE - MUTAGEN
Result: May alter genetic material.

Human
1 MMOL/L
Cell Type: mammary gland
Unscheduled DNA synthesis

Rat
100 MG/KG
Intraperitoneal
Micronucleus test

Rat
150 MG/KG
Oral
5D
Unscheduled DNA synthesis

Rat
1 MMOL/L
Cell Type: Other cell types
DNA inhibition

Rat
600 MG/KG
Oral
10D
Sister chromatid exchange

Rat
150 MG/KG
Oral
5D
Dominant lethal test

Mouse
50 MG/KG
Intraperitoneal
Micronucleus test

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

Mouse
50 MG/KG
Intraperitoneal
specific locus test

Mouse
12500 UG/L
Cell Type: fibroblast
Morphological transformation.

Mouse
25 MG/L
Cell Type: Embryo

Morphological transformation.

Mouse
100 MG/KG
Intraperitoneal
DNA damage

Mouse
62500 UG/KG
Intraperitoneal
Unscheduled DNA synthesis

Mouse
500 PPM
Oral
2W
Cytogenetic analysis

Mouse
750 MG/L
Cell Type: lymphocyte
Cytogenetic analysis

Mouse
100 MG/KG
Intraperitoneal
Cytogenetic analysis

Mouse
125 UG/KG
Intraperitoneal
Sister chromatid exchange

Mouse
120 MG/KG
Intraperitoneal
SLN

Mouse
125 MG/KG
Intraperitoneal
Dominant lethal test

Mouse
840 MG/KG
Oral
20W
Dominant lethal test

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

Mouse
100 MG/KG
Intraperitoneal
sperm

Mouse
96634 UG/KG
Oral

4W
sperm

Mouse
50 MG/KG
Intraperitoneal
Heritable translocation test

Hamster
150 MG/L
Cell Type: lung
Cytogenetic analysis

Hamster
500 MG/L
Cell Type: fibroblast
Cytogenetic analysis

Hamster
300 MG/L
Cell Type: lung
Sister chromatid exchange

Hamster
500 MG/L
Cell Type: lung
SLN

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 - 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.

CMR CAT.: Carc. Cat.2

12 - Ecological Information

ECOTOXICOLOGICAL EFFECTS

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

13 - Disposal Considerations

SUBSTANCE DISPOSAL
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.

14 - Transport Information

RID/ADR
UN#: 2074
Class: 6.1
PG: III
Proper Shipping Name: Acrylamide

IMDG
UN#: 2074
Class: 6.1
PG: III
Proper Shipping Name: ACRYLAMIDE, SOLID
Marine Pollutant: No
Severe Marine Pollutant: No

IATA
UN#: 2074
Class: 6.1
PG: III
Proper Shipping Name: Acrylamide
Inhalation Packing Group I: No

15 - Regulatory Information

CLASSIFICATION AND LABELING ACCORDING TO EU DIRECTIVES
ANNEX I INDEX NUMBER: 616-003-00-0
NOTA: D,E
INDICATION OF DANGER: T
Toxic.
R-PHRASES: 45 46 20/21 25 36/38 43 48/23/24/25 62
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-PHRASES: 53 45
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).

COUNTRY SPECIFIC INFORMATION

Germany
WGK: 3

SWITZERLAND
SWISS POISON CLASS: 2

16 - Other Information

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.

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