

## Material Safety Data Sheet

### Section 1 Chemical Product and Company Identification

MSDS Name: Acrylamide powder  
 Product Code: 30-25-XX  
 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  
 Company identification: Severn Biotech Limited  
 Unit 2 Park Lane Industrial Estate  
 Kidderminster  
 Worcestershire  
 DY11 6TJ  
 For information call: +44 (0)1562 825286

### Section 2 - Composition, Information on Ingredients

CAS: 79-06-1  
 Chemical Name: Acrylamide  
 %: 99-100  
 EINECS: 201-173-7

Risk Phrases: T - Toxic, R2, R20, R21, R23, R24, R25, R36, R38, R43, R45, R46, R48, R62, Carc.2, Mut.2

### Section 3 - Hazards Identification

#### EMERGENCY OVERVIEW

CARCINOGENIC - ACRYLAMIDE IS A PROBABLE HUMAN CARCINOGEN AND HUMAN NEUROTOXIN. ANOTHER MINOR COMPONENT HAS BEEN SHOWN TO CAUSE CANCER IN LABORATORY ANIMALS AND IS ALSO NEUROTOXIC. MAY BE IRRITATING TO EYES, SKIN AND RESPIRATORY TRACT.

#### Potential Health Effects

Eye: Toxic and irritating to the eyes. Dust may cause severe irritation, with stinging, tearing, redness and pain.  
 Skin: Irritating and readily absorbed through skin. Toxic.  
 Ingestion: Toxic by ingestion. Possible teratogen. May cause heritable genetic damage.  
 Inhalation: Inhalation may be fatal. Inhalation of dust irritates the respiratory tract. May cause coughing, dizziness, dullness, and headache. Higher concentrations can produce central nervous system depression, narcosis, and unconsciousness.  
 Chronic: Prolonged or repeated skin contact may cause cancer, heritable genetic damage, or teratogenitive effects. Possible carcinogen. May raise chance of cancer in subjects with already raised risk (e.g. Smokers)

### Section 4 - First Aid Measures

Eye: Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get medical attention.  
 Skin: Immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.  
 Ingestion: Drink 1 or 2 glasses of water and induce vomiting by touching the back of the throat with a finger or by giving syrup of ipecac. Never induce vomiting or give anything by mouth to an unconscious person. See a medical doctor

Inhalation: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.  
 Chronic: Seek medical attention immediately

Notes to Physician: Treat symptomatically and supportively.

## Section 5 - Fire Fighting Measures

General Information: In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

Fire: Not considered to be a fire hazard.

Explosion: Not considered to be an explosion hazard.

Extinguishing Media: Dry chemical, alcohol foam, polymer foam, water spray or carbon dioxide.

## Section 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.

## Section 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.

## Section 8 - Exposure Controls, Personal Protection

Airborne Exposure Limits: Poland NDS 0.1 MG/M3, Denmark OEL TWA 0.03 mg/m3  
 Remarks: HK, Germany TRGS 900 OEL 0.06 mg/m3 Remarks: 4, H,TRK,7,29,TRGS 901-25,  
 Norway OEL 0.03 mg/m3 Remarks: HKM, Switzerland OEL OEL 0.03 mg/m3 Remarks: E H K,  
 United Kingdom OEL OEL 0.3 mg/m3

Ventilation System: In general, dilution ventilation is a satisfactory health hazard control for this substance. However, if conditions of use create discomfort to the worker, a local exhaust system should be considered.

Personal Respirators (NIOSH Approved): For conditions of use where exposure to dust or mist is apparent and engineering controls are not feasible, a particulate respirator (NIOSH type N95 or better filters) may be worn. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection: Wear protective gloves and clean body-covering clothing.

Eye Protection: Safety glasses. Maintain eye wash fountain and quick-drench facilities in work area.

## Section 9 - Physical and Chemical Properties

Physical State: Clear solid  
 Colour: Colourless  
 Odour: Odourless

pH:	5.2 - 6.0 @ Concentration 500 g/L
Vapour Pressure:	1.6 @ 84.5 °C
Vapour Density:	2.45
Evaporation Rate:	Not available
Viscosity:	Solid
Boiling Point:	125 °C @ 25 mm Hg
Freezing/Melting Point:	84 °C
Decomposition Temperature:	Not available
Solubility in water:	Clear, colourless 0.2g/ml H <sub>2</sub> O, 20 °C
Specific Gravity/Density:	1.13 g/cm <sup>3</sup>
Molecular Formula:	C <sub>3</sub> H <sub>5</sub> NO
Molecular Weight:	71.08
Partition Coefficient Log Kow:	- 0.670
Flash Point:	138 °C
Autoignition Temperature:	424 °C

## Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.  
 Conditions to Avoid: Incompatible materials, dust generation, excess heat.  
 Incompatibilities with Other Materials: Concentrated nitric and sulphuric acid mixtures, oxidizing materials, iron and iron salts, copper, brass and free radical initiators.  
 Hazardous Decomposition Products: Carbon dioxide, carbon monoxide and ammonia may form when heated to decomposition.  
 Hazardous Polymerization May undergo polymerisation if exposed to heat or ultraviolet light. If polymerisation occurs in a closed container, sufficient heat and pressure may be generated to rupture the container.

## Section 11 - Toxicological Information

CAS: 79-06-1  
 LD50/LC50: LC50 Inhalation Rat > 1,500 mg/m<sup>3</sup> 4 H; LD50 Oral Rat 124 mg/kg; LD50 Skin Rat 400 mg/kg  
 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; 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 ml/Kg  
 Remarks: Behavioural: Hallucinations, distorted perceptions; LD50 Oral Guinea pig 150 mg/kg; LD50 Subcutaneous Guinea pig 170 mg/Kg  
 Remarks: Behavioural: Tremor. Behavioural: Muscle contraction or spasticity.  
 Gastrointestinal: Nausea or vomiting; LD50 Oral Quail 186 mg/kg  
 Remarks: Peripheral Nerve and Sensation: Flaccid paralysis without anaesthesia (usually neuromuscular blockage).  
 Behavioural: Altered sleep time (including change in righting reflex). Behavioural: Change in motor activity (specific assay); LD50 Oral Mammal 100 mg/kg

Carcinogenicity: 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 Effects: Testicular tumours.

Tumourigenic: Carcinogenic by RTECS criteria.

Mouse

Route of Application: Intraperitoneal

Exposure Time: 8W

Result: Lungs, Thorax, or Respiration: Tumours.

Tumourigenic: Neoplastic by RTECS criteria.

Mouse

Route of Application: Oral

Exposure Time: 2W

Result: Skin and Appendages: Other: Tumours. Lungs, Thorax, or Respiration: Tumours. Tumourigenic: Carcinogenic by RTECS criteria.

Mouse

Route of Application: Intraperitoneal

Exposure Time: 8W

Result: Tumourigenic: Neoplastic by RTECS criteria. Lungs, Thorax, or Respiration: Tumours.

Rat

Route of Application: Oral

Exposure Time: 2Y

Result: Tumourigenic Effects: Uterine tumours

Tumourigenic: Carcinogenic by RTECS criteria.

Rat

Route of Application: Oral

Exposure Time: 2Y

Result: Skin and Appendages: Other: Tumours. Brain and Coverings: Tumours. Tumourigenic: Carcinogenic by RTECS criteria.

IARC Carcinogen List Rating: Group 2A

Other: Rtecs Number: AS3325000

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

Sensitization: Sensitizer.

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: 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.

Target Organ Information: Nerves. Kidneys.

Chronic Exposure - Mutagen

Result: May alter genetic material.

Human: 1 Mol/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 Mol/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 mg/L Cell Type: fibroblast

Morphological transformation.

Mouse: 25 mg/L Cell Type: Embryo.

Mouse: 100 mg/Kg Intraperitoneal

DNA Damage

Mouse: 62500 mg/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 mg/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 mg/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 Foetus: Foetotoxicity (except death, e.g., stunted foetus).  
 Effects on Newborn: Behavioural.  
 Species: Mouse  
 Dose: 225 mg/Kg  
 Route of Application: Intraperitoneal  
 Exposure Time: (10-12D PREG)  
 Result: Effects on Embryo or Foetus: Foetotoxicity (except death, e.g., stunted foetus).  
 Specific Developmental Abnormalities:  
 Musculoskeletal system.  
 Species: Mouse  
 Dose: 125 mg/Kg  
 Route of Application: Intraperitoneal  
 Exposure Time: (1D PREG)  
 Result: Effects on Embryo or Foetus: Foetotoxicity (except death, e.g., stunted foetus).  
 Species: Mouse  
 Dose: 300 mg/Kg  
 Route of Application: Intraperitoneal  
 Exposure Time: (8-10D PREG)  
 Result: Effects on Embryo or Foetus: Foetotoxicity (except death, e.g., stunted foetus).  
 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

## Section 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

### Environmental Fate:

Not fully known, but In 1992, environmental releases of acrylamide, as reported to the Toxic Chemical Release Inventory by certain US industries, included 28 thousand pounds to the atmosphere, 10 thousand pounds to surface water, 4.2 million pounds to underground injection

sites, and 963 pounds to land (TRI92 1994). Concentrations of 0.3 ppb to 5 ppm acrylamide have been measured in various rivers near industries that use acrylamide and/or polyacrylamides (HSDB 1994). Cases of human poisoning have been documented from well water contaminated with acrylamide (no amounts given) from sewer grouting (HSDB 1994).

Atmospheric levels around six US plants averaged >0.2 microgram/m<sup>3</sup> (0.007 ppb) in either vapour or particulate form (HSDB 1994).

### Persistence and Degradability:

1. Air - In the atmosphere, acrylamide reacts with photochemically produced hydroxyl radicals; the estimated half-life is 6.6 hours (HSDB 1994).

2. Soil - Biodegradation is the major route of removal of acrylamide from soils (U.S. EPA 1985). In aerobic soils, the chemical is 74-94% degraded in 14 days while in waterlogged; anaerobic soil 64-89% is degraded in 14 days (U.S. EPA 1985). Depending on the soil type, estimated half-lives range from 21 to 36 hours (U.S. EPA 1985).

3. Water - Biodegradation is also the major route of removal of acrylamide from water. Several microorganisms capable of utilizing acrylamide as a sole carbon and nitrogen source have been isolated, including *Arthrobacter* sp., *Nocardia rhodochrous*, *Bacillus spaericus*, *Pseudomonas putrefaciens*, and *Rhodococcus* sp. (U.S. EPA 1985). Acclimation of microorganisms greatly increases the rate of biodegradation (HSDB 1994; U.S. EPA 1985).

Complete degradation of 10-20 ppm acrylamide in river water occurred in about 12 days with nonacclimated microorganisms; when the microorganisms were acclimated, degradation was complete in 2 days (U.S. EPA 1985).

### Bioaccumulative Potential:

Fish bioconcentration factors (BCF) for the carcass and viscera of fingerling trout are 0.86 and 1.12, respectively, indicating that no appreciable bioaccumulation of acrylamide is expected (HSDB 1994).

## Section 13 - Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to an appropriate, approved incinerator or disposed in an appropriate, approved waste facility. Processing, use or contamination of this product may change the waste management options. District and local disposal regulations may differ from Governmental disposal regulations. Dispose of container and unused contents in accordance with Governmental, District and local requirements.

#### **Section 14 - Transport Information**

Shipping Name: ACRYLAMIDE, SOLID  
Hazard Class: 6.1  
UN Number: UN 2074  
Packing Group: III

#### **Section 15 - Regulatory Information**

European/International Regulations

European Labelling in Accordance with EC Directives

Hazard Symbols: T - Toxic

Risk Phrases:

R45-46-20/21-25-36/38-43-48/23/24/25-62; 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.

Safety 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).

CAS: 79-06-1

#### **Section 16 - Other Information**

MSDS Creation Date: 18/06/2008

Revision number: 1

Revision Date: 07/08/2009

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