

## Material Safety Data Sheet

### Section 1 Chemical Product and Company Identification

MSDS Name: Acrylamide solution  
 Product Code: 20-2100-XX  
 Synonyms: Acrylamide/Bis-acrylamide Solution, Electrophoresis gel solution. For acrylamide; acrylic amide, ethylene carboxamide, propenamide, vinylamide.  
 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	Chemical Name	%	EINECS	Risk Phrases
7732-18-5	Water	<1	None	None
79-06-1	Acrylamide	1-30	201-173-7	T - Toxic, R23, R24, R25, R45, R46, R48, Carc.2, Mut.2
None	Crosslinker*	<10	None	T - Toxic, R23, R24, R25, R45, R46, R48.

\* Proprietary Ingredient

### 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. Splashes 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 vapours 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

Absorb on absorbent material and place into closed containers for later disposal. Flush area with water. Material sublimates; therefore, clean up all spills before they dry. For personal precautions, see section 8.

## Section 7 - Handling and Storage

Store in a cool (<25°C) dry area way from combustibles.

Long-term storage at 4°C, preferably refrigerated.

## Section 8 - Exposure Controls, Personal Protection

Airborne Exposure Limits: Acrylamide:

TWA: 0.03 (mg/m<sup>3</sup>) [Australia] Inhalation

TWA: 0.3 (mg/m<sup>3</sup>) from OSHA (PEL) [United States] Inhalation

TWA: 0.03 (mg/m<sup>3</sup>) from NIOSH Inhalation

TWA: 0.03 (mg/m<sup>3</sup>) from NIOSH SKIN

TWA: 0.3 (mg/m<sup>3</sup>) [United Kingdom (UK)] Inhalation

TWA: 0.03 (mg/m<sup>3</sup>) from ACGIH (TLV) [United States] [1999] Inhalation. Consult local authorities for acceptable exposure limits.

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, aqueous solution.

Colour: colourless.

Odour: None

pH: 6.8

Vapour Pressure: Not available  
 Vapour Density: Not available  
 Evaporation Rate: Not available  
 Viscosity: Non-viscous  
 Boiling Point: about 100oC  
 Freezing/Melting Point: Not available  
 Decomposition Temperature: Not available  
 Solubility in water: Soluble (aqueous solution)  
 Specific Gravity/Density: Not available  
 Molecular Formula: Not applicable  
 Molecular Weight: Not applicable  
 % Volatiles by volume @ 21°C: 50-70% water

For Acrylamide:  
 Flash Point: 138 °C  
 Autoignition Temp: 424 °C

**Section 10 - Stability and Reactivity**

Chemical Stability: Stable under normal temperatures and pressures.  
 Conditions to Avoid: Incompatible materials, excess heat.  
 Incompatibilities with Other Materials: Avoid strong oxidisers, acids, bases and vinyl polymerisation initiators. Also avoid contamination with iron, copper, aluminium, brass and bronze.  
 Hazardous Decomposition Products: Carbon dioxide, carbon monoxide, ammonia and nitrous oxides 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**

LD50/LC50: Skin Contact: No data available for formulation. Acrylamide: Mild to moderate irritant (rabbit) Doc.TLVs 1986, Gosselin 1984  
 Skin Absorption: No data available for formulation. Acrylamide: Dermal LD50 = 500 mg/kg IARC 1986.  
 Inhalation: No data available for formulation.  
 Ingestion: No data available for formulation. Acrylamide: Oral LD50 = 170 mg/kg (rat), RTECS 1983  
 Eye Contact: No data available for formulation. Acrylamide: Moderate to severe irritation (rabbit), Doc TLVs 1986, Gosselin 1984, RTECS 1983.

Carcinogenicity:

Carcinogenicity	IARC	NTP	Other (OSHA)	ACGIH
Yes, acrylamide	Yes	Yes	No	Yes
Yes, proprietary component	No	Yes	No	No

Other: See actual entry in RTECS for complete information.

**Acute Effects from Overexposure:**

No data available for the formulation. Acrylamide is toxic by the oral and dermal routes of exposure. It is readily absorbed through the skin and by inhalation. Acrylamide is a human neurotoxin causing damage to both the central and peripheral nervous system.

Symptoms include muscular weakness (particularly in the lower limbs), ataxia, tremors, numbness and tingling. Neurotoxicity produced by dermal exposure may be preceded by peeling and redness of the skin on the hands and feet. Mild cases of poisoning appear to be reversible with time if exposure is terminated. Other adverse effects may include irritation to skin eyes and respiratory tract. Contact dermatitis has been reported with acrylamide.

**Chronic Effects from Overexposure:**

No data available for the formulation. Testicular degeneration as well as reduced sperm motility, impaired fertility and dominant lethal effects with sub chronic exposure to acrylamide have been reported in laboratory animals. Impairment of visual function was observed in female monkeys treated with acrylamide (10mg/kg bw). Acrylamide is classified as a suspect or probable human carcinogen by ACGIH, IARC and EPA. Acrylamide has produced chromosome damage as well as mutations in several in vitro and in vivo tests.

Another component has also shown clear evidence of carcinogenicity in experimental animals in a 2-year NTP gavage study.

## Section 12 - Ecological Information

**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).

**Environmental Toxicity:**

Long term degradation products may harm aquatic life.

**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

Dispose of in a manner consistent with government and local regulations.

## Section 14 - Transport Information

Shipping Name: ACRYLAMIDE SOLUTION  
Hazard Class: 6.1  
UN Number: UN 3426  
Packing Group: III

## Section 15 - Regulatory Information

European/International Regulations  
European Labelling in Accordance with EC Directives  
Hazard Symbols: T (Toxic)

Risk Phrases:

R45 May cause cancer, R46 May cause heritable genetic damage, R24/25 Also toxic in contact with skin and if swallowed, R48/23/24/25 Also toxic; danger of serious damage to health by prolonged exposure in contact with skin and if swallowed, R36 Irritating to eyes, R37 Irritating to respiratory system, R38 Irritating to skin.

Safety Phrases:

S53 Avoid exposure - obtain special instructions before use, S45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible)

Caution - this preparation contains substance(s) not yet fully tested

## Section 16 - Other Information

MSDS Creation Date: 18/06/2008  
Revision number: 1  
Revision Date: 06/08/2009

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential, or exemplary damages howsoever arising, even if the company has been advised of the possibility of such damages.