

SAFETY DATA SHEET

ANGUS CHEMICAL COMPANY

Product name : HEPES BIOLOGICS PLUS

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ANGUS CHEMICAL COMPANY encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. PRODUCT AND COMPANY IDENTIFICATION

Product name : HEPES BIOLOGICS PLUS

Manufacturer or supplier's details

Company name of supplier : ANGUS CHEMICAL COMPANY

Address : 1500 E. LAKE COOK ROAD
Buffalo Grove IL 60089-6553

Customer Information Number +1-847-808-3711

E-mail address NAR_CC@ANGUS.COM

Emergency telephone number +1 800-424-9300 (24x7)Recommended use : Life sciences research chemical.
The ANGUS Chemical Company recommends that you use this product in a manner consistent with the listed use. If your intended use is not consistent with the stated use, please contact the Customer Information Group (see Section 1 of this data sheet).

2. HAZARDS IDENTIFICATION

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Not a hazardous substance or mixture.

GHS label elements

Not a hazardous substance or mixture.

Other hazards

None known.

3. COMPOSITION/INFORMATION ON INGREDIENTS

This product is a substance.

Components

| Chemical name | CAS-No. | Concentration (% w/w) |
|--|-----------|-----------------------|
| N-2-Hydroxyethyl Piperazine-N'-2-Ethanesulfonic Acid | 7365-45-9 | >= 99.5 - <= 100 |

4. FIRST AID MEASURES

| | | |
|---|---|---|
| If inhaled | : | Move person to fresh air; if effects occur, consult a physician. |
| In case of skin contact | : | Wash off with plenty of water. |
| In case of eye contact | : | Flush eyes thoroughly with water for several minutes. Remove contact lenses after the initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably an ophthalmologist. |
| If swallowed | : | No emergency medical treatment necessary. |
| Most important symptoms and effects, both acute and delayed | : | None known. |
| Protection of first-aiders | : | If potential for exposure exists refer to Section 8 for specific personal protective equipment. |

5. FIREFIGHTING MEASURES

| | | |
|---|---|--|
| Suitable extinguishing media | : | Water. Carbon dioxide fire extinguishers. Dry chemical fire extinguishers. |
| Specific hazards during firefighting | : | Pneumatic conveying and other mechanical handling operations can generate combustible dust. To reduce the potential for dust explosions, do not permit dust to accumulate. |
| Hazardous combustion products | : | During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Carbon dioxide. Carbon monoxide. Nitrogen oxides. Sulfur oxides. |
| Further information | : | Hand held dry chemical or carbon dioxide extinguishers may be used for small fires. Soak thoroughly with water to cool and prevent re-ignition. Cool surroundings with water to localize fire zone. Keep people away. Isolate fire and deny unnecessary entry. |
| Special protective equipment for firefighters | : | Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). |

If protective equipment is not available or not used, fight fire from a protected location or safe distance.

6. ACCIDENTAL RELEASE MEASURES

- Personal precautions, protective equipment and emergency procedures : Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.
- Environmental precautions : Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.
- Methods and materials for containment and cleaning up : Contain spilled material if possible.
Collect in suitable and properly labeled containers.
Use care to minimize generation of airborne dust.
See Section 13, Disposal Considerations, for additional information.
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7. HANDLING AND STORAGE

- Advice on safe handling : Keep container closed.
Good housekeeping and controlling of dusts are necessary for safe handling of product.
Avoid generating and breathing dust.
See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.
- Conditions for safe storage : Store in a cool, dry place.
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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Contains no substances with occupational exposure limit values.

- Engineering measures** : Local exhaust ventilation may be necessary for some operations.
Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations.

Personal protective equipment

- Respiratory protection : Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process.
In dusty or misty atmospheres, use an approved particulate respirator.

Hand protection

- Remarks : Use gloves chemically resistant to this material when

prolonged or frequently repeated contact could occur. Examples of preferred glove barrier materials include: Neoprene. Polyvinyl chloride ("PVC" or "vinyl"). Nitrile/butadiene rubber ("nitrile" or "NBR"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Eye protection : Use safety glasses (with side shields).
Skin and body protection : Wear clean, body-covering clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : Solid.

Colour : White

Odour : Odorless

Odour Threshold : Method: Literature
Odorless

pH : 5 - 6.5
Method: Literature

Freezing point : No test data available

Melting point/range : 453 - 460 °F / 234 - 238 °C
Method: Literature

Boiling point/boiling range : No test data available

Flash point : Method: closed cup
No test data available

Evaporation rate : Not applicable

Upper explosion limit / Upper flammability limit : No test data available

Lower explosion limit / Lower flammability limit : No test data available

Vapour pressure : No test data available

Relative vapour density : No test data available

Solubility(ies)
Water solubility : soluble

Partition coefficient: n-octanol/water : Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
log Pow: -3.61
Method: estimated

| | | |
|---------------------------|---|------------------------------------|
| Auto-ignition temperature | : | No test data available |
| Decomposition temperature | : | No test data available |
| Viscosity | | |
| Viscosity, kinematic | : | Not applicable |
| Molecular weight | : | 238.30 g/mol Method: Literature |
| Particle size | : | No data available |

10. STABILITY AND REACTIVITY

| | | |
|----------------------------------|---|---|
| Reactivity | : | No decomposition if stored and applied as directed. |
| Chemical stability | : | No decomposition if stored and applied as directed. |
| Conditions to avoid | : | Exposure to elevated temperatures can cause product to decompose. |
| Incompatible materials | : | Avoid contact with: Strong oxidizers. |
| Hazardous decomposition products | : | Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Nitrogen oxides. Sulfur oxides. |

11. TOXICOLOGICAL INFORMATION

Toxicological information on this product or its components appear in this section when such data is available.

Acute toxicity

Not classified based on available information.

Product:

| | | |
|---------------------------|---|---|
| Acute oral toxicity | : | Remarks: Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts. LD50 (Rat): > 5,000 mg/kg |
| Acute inhalation toxicity | : | Remarks: Dust may cause irritation to upper respiratory tract (nose and throat). Vapors are unlikely due to physical properties. Remarks: The LC50 has not been determined. |
| Acute dermal toxicity | : | Remarks: Prolonged skin contact is unlikely to result in absorption of harmful amounts. LD50 (Rabbit): > 2,000 mg/kg Symptoms: No deaths occurred at this concentration. Assessment: The substance or mixture has no acute dermal toxicity |

Skin corrosion/irritation

Not classified based on available information.

Product:

Remarks : Prolonged contact may cause slight skin irritation with local redness.

Serious eye damage/eye irritation

Not classified based on available information.

Product:

Remarks : Essentially nonirritating to eyes.

Respiratory or skin sensitisation**Skin sensitisation**

Not classified based on available information.

Respiratory sensitisation

Not classified based on available information.

Product:

Remarks : For skin sensitization:
No relevant data found.

Remarks : For respiratory sensitization:
No relevant data found.

Germ cell mutagenicity

Not classified based on available information.

Carcinogenicity

Not classified based on available information.

IARC No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

NTP No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Teratogenicity**Product**

No relevant data found.

Mutagenicity**Product**

No relevant data found.

Reproductive toxicity

Not classified based on available information.

STOT - single exposure

Not classified based on available information.

Product:

Assessment : Evaluation of available data suggests that this material is not an STOT-SE toxicant.

STOT - repeated exposure

Not classified based on available information.

Repeated dose toxicity**Product:**

Remarks : No relevant data found.

Aspiration toxicity

Not classified based on available information.

Product:

Based on physical properties, not likely to be an aspiration hazard.

12. ECOLOGICAL INFORMATION

Ecotoxicity**Product:**

Toxicity to daphnia and other aquatic invertebrates :

Remarks: Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

LC50 (Daphnia magna (Water flea)):
Exposure time: 48.0 h

Components:**4-(2-hydroxyethyl)piperazin-1-ylethanesulphonic acid:**

Toxicity to daphnia and other aquatic invertebrates :

Remarks: Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

LC50 (Daphnia magna (Water flea)): Exposure time: 48.0 h

Persistence and degradability**Product:**

Biodegradability : Remarks: No relevant information found.

Components:**4-(2-hydroxyethyl)piperazin-1-ylethanesulphonic acid:**

Biodegradability :

Remarks: No relevant information found.

Bioaccumulative potential**Components:****4-(2-hydroxyethyl)piperazin-1-ylethanesulphonic acid:**

Partition coefficient: n-octanol/water : Remarks: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

log Pow: -3.61
Method: estimated

Mobility in soil**Product:**

Distribution among environmental compartments : Remarks: Potential for mobility in soil is medium (Koc between 150 and 500).

Koc: 164.2
Method: Estimated.

Components:**4-(2-hydroxyethyl)piperazin-1-ylethanesulphonic acid:**

Distribution among environmental compartments : Remarks: Potential for mobility in soil is medium (Koc between 150 and 500).

Koc: 164.2
Method: Estimated.

Other adverse effects**Product:**

Results of PBT and vPvB assessment : This substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).

Ozone-Depletion Potential : Remarks: No data available

Components:**4-(2-hydroxyethyl)piperazin-1-ylethanesulphonic acid:**

Results of PBT and vPvB assessment : This substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).

Ozone-Depletion Potential : Remarks: No data available

13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues : DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.
All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations.

Regulations may vary in different locations.
Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.
THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information.
FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Incinerator or other thermal destruction device.
Landfill.
ANGUS HAS NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL.

14. TRANSPORT INFORMATION

International Regulations

IATA-DGR

Not regulated as a dangerous good

IMDG-Code

Not regulated as a dangerous good

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

National Regulations

49 CFR

Not regulated as a dangerous good

Special precautions for user

Not applicable

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture

CERCLA Reportable Quantity

This material does not contain any components with a CERCLA RQ.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards : No SARA Hazards

SARA 313 : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCM/ Intermediate or Final VOC's (40 CFR 60.489).

Clean Water Act

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.

This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.

This product does not contain any toxic pollutants listed under the U.S. Clean Water Act Section 307

US State Regulations

Massachusetts Right To Know

No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know

4-(2-hydroxyethyl)piperazin-1-ylethanesulphonic acid 7365-45-9

Maine Chemicals of High Concern

Product does not contain any listed chemicals

Vermont Chemicals of High Concern

Product does not contain any listed chemicals

Washington Chemicals of High Concern

Product does not contain any listed chemicals

California Prop. 65

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

The components of this product are reported in the following inventories:

TSCA : On TSCA Inventory y (positive listing)

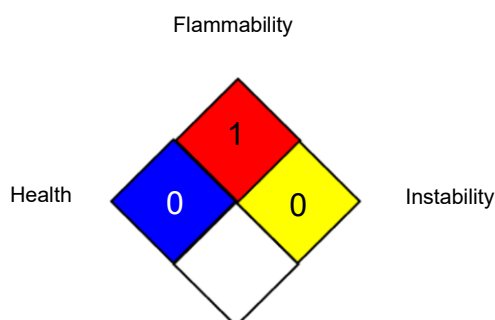
TSCA list

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

16. OTHER INFORMATION

Further information

NFPA 704:**HMIS® IV:**

| | | |
|------------------------|--|----------|
| HEALTH | | 0 |
| FLAMMABILITY | | 0 |
| PHYSICAL HAZARD | | 0 |

HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. The "*" represents a chronic hazard, while the "/" represents the absence of a chronic hazard.

Full text of other abbreviations

AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

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The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

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