SAFETY DATA SHEET

ANGUS CHEMICAL COMPANY

Product name : TRIS AMINO® Hydrochloride, Biologics Plus (TRIS (Hydroxymethyl)Aminomethane, Hydrochloride)

Revision Date: 04/06/2023
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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 : TRIS AMINO® Hydrochloride, Biologics Plus (TRIS (Hydroxymethyl)Aminomethane, Hydrochloride)

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 : Biological buffer.
Pharmaceutical intermediate.
For industrial use.
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)
Tris(hydroxymethyl)aminomethane hydrochloride	1185-53-1	>= 99 - <= 100

4. FIRST AID MEASURES

General advice	:	No hazards which require special first aid measures.
If inhaled	:	Move to fresh air in case of accidental inhalation of dust or fumes from overheating or combustion. If symptoms persist, call a physician.
In case of skin contact	:	Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water.
In case of eye contact	:	Flush eyes with water as a precaution. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing.
If swallowed	:	Clean mouth with water and drink afterwards plenty of water. Do not give milk or alcoholic beverages. Never give anything by mouth to an unconscious person.
Most important symptoms and effects, both acute and delayed	:	None known.

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.

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. 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	:	Avoid dust formation.
Environmental precautions	:	No special environmental precautions required.
Methods and materials for containment and cleaning up	:	Sweep up and shovel. Keep in suitable, closed containers for disposal.

7. HANDLING AND STORAGE

Advice on protection against fire and explosion	:	Avoid dust formation. Provide appropriate exhaust ventilation at places where dust is formed.
Advice on safe handling	:	For personal protection see section 8. No special handling advice required.
Materials to avoid	:	No special restrictions on storage with other products.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Contains no substances with occupational exposure limit values.

Personal protective equipment

Respiratory protection	:	No personal respiratory protective equipment normally required.
Hand protection		
Remarks	:	For prolonged or repeated contact use protective gloves.
Eye protection	:	Safety glasses
Skin and body protection	:	Protective suit

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	Solid.
Colour	:	White
Odour	:	Odorless
pH	:	3.5 - 5 Method: Literature
Freezing point	:	No test data available
Melting point/range		302 °F / 150 °C Method: Literature
Boiling point/boiling range	:	No test data available
Flash point	:	Method: closed cup No test data available
Upper explosion limit / Upper flammability limit	:	No test data available
Lower explosion limit / Lower flammability limit	:	No test data available
Vapour pressure	:	Nil
Relative vapour density	:	No test data available
Solubility(ies)		
Water solubility	:	Method: Literature
Decomposition temperature	:	No test data available
Viscosity		
Viscosity, kinematic	:	Not applicable
Molecular weight	:	157.6 g/mol Method: Literature
Particle size	:	No data available

10. STABILITY AND REACTIVITY

Reactivity	:	No data available.
Chemical stability	:	No decomposition if stored and applied as directed.
Possibility of hazardous reactions	:	Polymerization will not occur.
Conditions to avoid	:	Exposure to elevated temperatures can cause product to decompose.
Incompatible materials	:	Avoid contact with: Oxidizers.
Hazardous decomposition	:	Decomposition products depend upon temperature, air supply

products	and the presence of other materials. Decomposition products can include and are not limited to: Nitrogen oxides. Decomposition products can include trace amounts of: Hydrogen chloride.

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 Symptoms: No deaths occurred at this concentration.
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 (Rat, male and female): > 5,000 mg/kg Method: OECD 402 or equivalent Symptoms: No deaths occurred at this concentration.

Skin corrosion/irritation

Not classified based on available information.

Product:

Remarks	:	Prolonged contact is essentially nonirritating to skin. Brief contact is essentially nonirritating to skin.

Serious eye damage/eye irritation

Not classified based on available information.

Product:

Remarks	:	May cause slight temporary eye irritation. Corneal injury is unlikely.

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: Did not cause allergic skin reactions when tested in guinea pigs.
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

For similar material(s):

Did not cause birth defects or any other fetal effects in laboratory animals.

Mutagenicity

Product

In vitro genetic toxicity studies were negative.

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	:	Based on available data, repeated exposures are not anticipated to cause significant adverse effects.

Aspiration toxicity

Not classified based on available information.

Product:

Product test data not available.

Further information

Product:

Remarks : No data available

12. ECOLOGICAL INFORMATION

Ecotoxicity

Product:

Toxicity to fish :

Remarks: Material is practically non-toxic to fish on an acute basis (LC50 > 100 mg/L).

LC50 (zebra fish (Brachydanio rerio)): 460 mg/l
Exposure time: 96.0 h
Remarks: For similar material(s):

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 980.00 mg/l
Exposure time: 48.0 h

Toxicity to algae/aquatic plants : ErC50 (Pseudokirchneriella subcapitata (green algae)): 397 mg/l
End point: Growth rate
Exposure time: 72 h

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (water flea Daphnia magna): 3.99 mg/l
End point: number of offspring
Exposure time: 21 d
Remarks: For similar material(s):

Components:

2-amino-2-(hydroxymethyl)propane-1,3-diol hydrochloride:

Toxicity to fish : Remarks: Material is practically non-toxic to fish on an acute basis (LC50 > 100 mg/L).

LC50 (Leuciscus idus (Golden orfe)): > 10,000 mg/l
Exposure time: 96.0 h
Test Type: static test

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 980.00 mg/l
Exposure time: 48.0 h

Toxicity to algae/aquatic : ErC50 (Pseudokirchneriella subcapitata (green algae)): 397

plants		mg/l End point: Growth rate inhibition Exposure time: 72 h

Persistence and degradability

Product:

Biodegradability	:	Result: Readily biodegradable. Remarks: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation: 100 % Exposure time: 28 d Method: OECD Test Guideline 301F Remarks: 10-day Window: Pass
Biochemical Oxygen Demand (BOD)	:	0 % Incubation time: 5 d
	:	84% Incubation time: 28 d
Photodegradation	:	Test Type: Half-life (indirect photolysis) Sensitiser: OH radicals Rate constant: 3.35E-11 cm3/s Method: Estimated.

Components:

2-amino-2-(hydroxymethyl)propane-1,3-diol hydrochloride:

Biodegradability	:	Result: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation: 100 % Exposure time: 28 d Method: OECD Test Guideline 301F or Equivalent Remarks: 10-day Window: Pass

Bioaccumulative potential

Components:

2-amino-2-(hydroxymethyl)propane-1,3-diol hydrochloride:

Partition coefficient: n-octanol/water	:	log Pow: -2.31 Method: Measured Remarks: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Mobility in soil

No data available

Other adverse effects

Product:

Additional ecological information	:	There is no data available for this product.

Components:

2-amino-2-(hydroxymethyl)propane-1,3-diol hydrochloride:

Results of PBT and vPvB assessment	:	This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).
Ozone-Depletion Potential	:	Remarks: This substance is not in Annex I of Regulation (EC) No 1005/2009 on substances that deplete the ozone layer.

13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues	:	Offer surplus and non-recyclable solutions to a licensed disposal company.
Contaminated packaging	:	Empty remaining contents. Empty containers should be taken to an approved waste handling site for recycling or disposal.

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

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCMI 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

2-amino-2-(hydroxymethyl)propane-1,3-diol hydrochloride 1185-53-1

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

New Jersey Right To Know

2-amino-2-(hydroxymethyl)propane-1,3-diol hydrochloride 1185-53-1

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

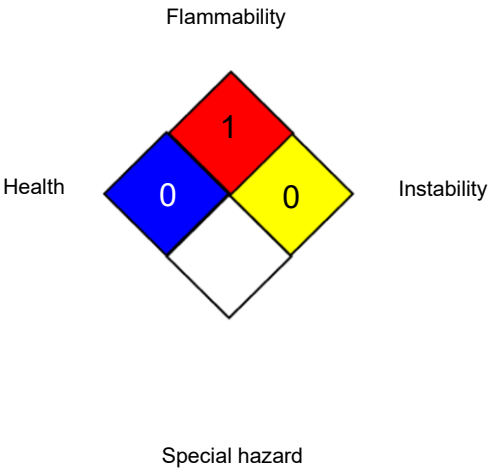
No substances are subject to a Significant New Use Rule.

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

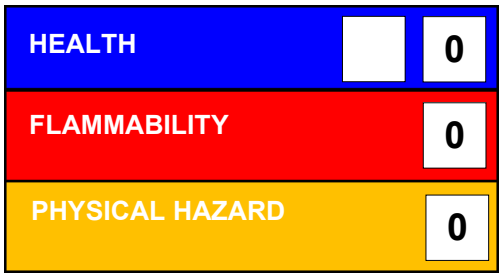
16. OTHER INFORMATION

Further information

NFPA 704:



HMIS® IV:



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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