

Scientific Documentation

Tranexamic Acid, USP

Not appropriate for regulatory submission.

Please visit www.spectrumchemical.com or contact Tech Services for the most up-to-date information contained in this information package.

Spectrum Chemical Mfg Corp 769 Jersey Avenue New Brunswick, NJ 08901 Phone 732.214.1300





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Specification for Tranexamic Acid, USP (T4046)

Item Number	T4046
Item	Tranexamic Acid, USP
CAS Number	1197-18-8
Molecular Formula	$C_8H_{15}NO_2$
Molecular Weight	157.21
MDL Number	
Synonyms	trans-4-(Aminomethyl)-cyclohexanecarboxylic Acid; AMCA

Test	Specification	
	Min	Max
APPEARANCE		
ASSAY (DRIED BASIS)	98.0	102.0 %
CHLORIDE		0.014 %
LOSS ON DRYING		0.5 %
RESIDUE ON IGNITION		0.1 %
ORGANIC IMPURITIES:		
TRANEXAMIC ACID RELATED COMPOUND C		0.1 %
AMINOMETHYL-BENZOIC ACID		0.1 %
cis-TRANEXAMIC ACID		0.2 %
DITRANEXAMIC ACID AMINE		0.1 %
ANY INDIVIDUAL, UNSPECIFIED IMPURITY		0.05 %
TOTAL IMPURITIES		0.2 %
ELEMENTAL IMPURITIES	AS REPORTED	
IDENTIFICATION (FTIR)	SPECTRUM MATCHES REFERENCE	
IDENTIFICATION (B)	RETENTION TIME CORRESPONDS TO STANDARD	
EXPIRATION DATE		
DATE OF MANUFACTURE		
MONOGRAPH EDITION		
RESIDUAL SOLVENTS	AS REPORTED	

Spectrum Chemical Mfg Corp

Corporate Headquarters:West Coast Facility:769 Jersey Ave.14422 S. San Pedro St.

New Brunswick, NJ 08901 Gardena, CA 90248

732.214.1300 310.516.8000



Certificate Of Analysis

Item Number	T4046	Lot Number	1MH0263
Item	Tranexamic Acid, USP	Manufacturer Lot	X2307024M
CAS Number	1197-18-8	Manufacturer Code	5704
Molecular Formula	$C_8H_{15}NO_2$	Molecular Weight	157.21

TECT	SPECIFICATION		DECLUT	
TEST	MIN	MAX	RESULT	
APPEARANCE			WHITE POWDER	
ASSAY (DRIED BASIS)	98.0	102.0 %	100.0 %	
CHLORIDE		0.014 %	<0.014 %	
LOSS ON DRYING		0.5 %	0.1 %	
RESIDUE ON IGNITION		0.1 %	0.0 %	
ORGANIC IMPURITIES:				
TRANEXAMIC ACID RELATED COMPOUND C		0.1 %	0.0 %	
AMINOMETHYL-BENZOIC ACID		0.1 %	0.0 %	
cis-TRANEXAMIC ACID		0.2 %	0.0 %	
DITRANEXAMIC ACID AMINE		0.1 %	0.0 %	
ANY INDIVIDUAL, UNSPECIFIED IMPURITY		0.05 %	0.00 %	
TOTAL IMPURITIES		0.2 %	<0.2 %	
ELEMENTAL IMPURITIES	AS REPORTED		COMPLIES WITH STANDARD	
IDENTIFICATION (FTIR)	SPECTRUM MATCHES REFERENCE		SPECTRUM MATCHES REFERENCE	
IDENTIFICATION (B)	RETENTION TIME CORRESPONDS TO STANDARD		RETENTION TIME CORRESPONDS TO STANDARD	
EXPIRATION DATE			15-JUL-2028	
DATE OF MANUFACTURE			16-JUL-2023	
MONOGRAPH EDITION			(USP-NF) 2023	

TECT	SPECIFI	CATION	DECLUT.
TEST	MIN	MAX	RESULT
RESIDUAL SOLVENTS	AS REPORTED		
CLASS 2 (solvent) / CHLOROBENZENE			<360 ppm (M)
CLASS 2 (solvent) / XYLENE			<2170 ppm (M)
CLASS 3 (solvent) / ETHANOL			<5000 ppm (M)
NOTE:All results reported with (M) are			
from manufacturer certificate of			
analysis			

Certificate of Analysis Results Entered By:

HBERMUDEZ Hernan Bermudez 02-OCT-23 09:21:36

Spectrum Chemical Mfg Corp 14422 South San Pedro Street Gardena 90248 CA



Certificate of Analysis Results Approved By:

SHANSEN Selin Hansen 02-OCT-23 09:52:56

All pharmaceutical ingredients are tested using current edition of applicable pharmacopeia.

Read and understand label and SDS before handling any chemicals. All Spectrum's chemicals are for manufacturing, processing, repacking or research purposes by experienced personnel only. It is the customer's responsibility to provide adequate hazardous material training and ensure that appropriate Personal Protective Equipment (PPE) is used before handling any chemical.

Spectrum Chemical Mfg. Corp. repackages Active Pharmaceutical Ingredient chemicals provided by other manufacturers and suppliers. For traceability purposes, Spectrum's Certificate of Analysis contains an identifier code unique to each manufacturer or supplier, as well as the chemical's lot number provided on the original manufacturer Certificate of Analysis. This material is manufactured by Hunan Dongting Pharmaceutical Co., Ltd. at No. 16 Dongyan Road, Deshan, Changde City, Hunan 415001, China (CHN). Copies of the original Certificate of Analysis are available upon request from your Spectrum Sales Representative or by calling Spectrum's Quality Department at 1-800-772-8786.





Revision date 05-June-2020 Revision Number 1

1. Identification

Product identifier

Product Name TRANEXAMIC ACID, USP

Other means of identification

Product Code(s) T4046

Synonyms None

Recommended use of the chemical and restrictions on use

Recommended use No information available

Restrictions on use No information available

Details of the supplier of the safety data sheet

Supplier Address

Spectrum Chemical Mfg. Corp. 14422 South San Pedro St. Gardena, CA 90248 (310) 516-8000

Emergency telephone number

Emergency Telephone Chemtrec 1-800-424-9300

2. Hazard(s) identification

Classification

Hazards not otherwise classified (HNOC)

Not applicable

Label elements

Hazard statements

Appearance No information available Physical state No information available Odor No information available

Other information

No information available.

3. Composition/information on ingredients

Substance

*The exact percentage (concentration) of composition has been withheld as a trade secret.

4. First-aid measures

Description of first aid measures

Inhalation Remove to fresh air.

Eye contact Rinse thoroughly with plenty of water for at least 15 minutes, lifting lower and upper eyelids.

Consult a physician.

Skin contact Wash skin with soap and water.

Ingestion Clean mouth with water and drink afterwards plenty of water.

Most important symptoms and effects, both acute and delayed

Symptoms No information available.

Indication of any immediate medical attention and special treatment needed

5. Fire-fighting measures

surrounding environment.

Large Fire CAUTION: Use of water spray when fighting fire may be inefficient.

Unsuitable extinguishing media Do not scatter spilled material with high pressure water streams.

Specific hazards arising from the

chemical

No information available.

Explosion data

fire-fighters

Sensitivity to mechanical impact none.

Sensitivity to static discharge none.

Special protective equipment for

Firefighters should wear self-contained breathing apparatus and full firefighting turnout

gear. Use personal protection equipment.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Personal precautions Ensure adequate ventilation.

Methods and material for containment and cleaning up

Methods for containment Prevent further leakage or spillage if safe to do so.

Methods for cleaning up Pick up and transfer to properly labeled containers.

7. Handling and storage

Precautions for safe handling

Advice on safe handling Handle in accordance with good industrial hygiene and safety practice.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep container tightly closed in a dry and well-ventilated place.

8. Exposure controls/personal protection

Control parameters

Exposure Limits This product, as supplied, does not contain any hazardous materials with occupational

exposure limits established by the region specific regulatory bodies.

Appropriate engineering controls

Engineering controls Showers

Eyewash stations Ventilation systems.

Individual protection measures, such as personal protective equipment

Eye/face protection No special protective equipment required.

Skin and body protectionNo special protective equipment required.

Respiratory protection No protective equipment is needed under normal use conditions. If exposure limits are

exceeded or irritation is experienced, ventilation and evacuation may be required.

General hygiene considerations Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Information on basic physical and chemical properties

Physical state
Appearance
Color
Odor
Odor
No information available

Property Values Remarks • Method

no data available None known Ha Melting point / freezing point no data available None known **Boiling point / boiling range** no data available None known no data available Flash point None known no data available None known **Evaporation rate** Flammability (solid, gas) no data available None known

Flammability Limit in Air None known

Upper flammability or explosive No data available

limits

Lower flammability or explosive No data available

limits

No data available None known Vapor pressure Vapor density no data available None known Relative density no data available None known Water solubility No data available None known Solubility(ies) no data available None known **Partition coefficient** No data available None known **Autoignition temperature** no data available None known **Decomposition temperature** None known

Kinematic viscosity

No data available

None known

None known

None known

Other information

Explosive properties

Oxidizing properties

No information available
VOC Content (%)
Liquid Density
No information available
Bulk density
No information available

10. Stability and reactivity

Reactivity No information available.

Chemical stability Stable under normal conditions.

Possibility of hazardous reactions None under normal processing.

Conditions to avoid None known based on information supplied.

Incompatible materialsNone known based on information supplied.

Hazardous decomposition products None known based on information supplied.

11. Toxicological information

Information on likely routes of exposure

Inhalation Specific test data for the substance or mixture is not available.

Eye contact Specific test data for the substance or mixture is not available.

Skin contact Specific test data for the substance or mixture is not available.

Ingestion Specific test data for the substance or mixture is not available.

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms No information available.

Acute toxicity

Numerical measures of toxicity

No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Skin corrosion/irritation Serious eye damage/eye irritation Respiratory or skin sensitization Germ cell mutagenicity No information available. No information available. No information available. No information available.

Reproductive toxicity

No information available.

STOT - single exposure STOT - repeated exposure Aspiration hazard No information available. No information available. No information available.

Other adverse effects

No information available.

Interactive effects

No information available.

12. Ecological information

Ecotoxicity The environmental impact of this product has not been fully investigated.

Persistence and degradability

Bioaccumulation

No information available. Inherently biodegradable.

Other adverse effects No information available.

13. Disposal considerations

Waste treatment methods

Waste from residues/unused

products

Dispose of in accordance with local regulations. Dispose of waste in accordance with

environmental legislation.

Contaminated packaging Do not reuse empty containers.

14. Transport information

DOT not regulated

15. Regulatory information

International Inventories

TSCA Not listed

Note *Contact supplier for details. One or more substances in this product are either not listed

on the US TSCA inventory, listed on the confidential US TSCA inventory or are otherwise

exempted from inventory listing requirements

DSL/NDSL Complies EINECS/ELINCS Complies

ENCS IECSCThis product complies with ENCS:
This product complies with China:

KECL Complies **PICCS** Complies

AICS This product does not comply with AICS

Legend:

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

ENCS - Japan Existing and New Chemical Substances

IECSC - China Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

SARA 311/312 Hazard Categories

Should this product meet EPCRA 311/312 Tier reporting criteria at 40 CFR 370, refer to Section 2 of this SDS for appropriate classifications.

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material.

US State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

This product does not contain any substances regulated under applicable state right-to-know regulations

U.S. EPA Label Information

EPA Pesticide Registration Number Not applicable

16. Other information

<u>NFPA</u>

Health hazards 0 Flammability 0 Instability 0

Physical and chemical properties -

HMIS
Health hazards 0
Flammability 0
Physical hazards 0

Personal protection X

Key or legend to abbreviations and acronyms used in the safety data sheet

Legend Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

TWA TWA (time-weighted average) STEL STEL (Short Term Exposure Limit)

Ceiling Maximum limit value

Key literature references and sources for data used to compile the SDS

Agency for Toxic Substances and Disease Registry (ATSDR) U.S. Environmental Protection Agency ChemView Database

European Food Safety Authority (EFSA) EPA (Environmental Protection Agency) Acute Exposure Guideline Level(s) (AEGL(s))

U.S. Environmental Protection Agency Federal Insecticide, Fungicide, and Rodenticide Act

U.S. Environmental Protection Agency High Production Volume Chemicals

Food Research Journal

Hazardous Substance Database

International Uniform Chemical Information Database (IUCLID)

Japan GHS Classification

Australia National Industrial Chemicals Notification and Assessment Scheme (NICNAS)

NIOSH (National Institute for Occupational Safety and Health)

National Library of Medicine's ChemID Plus (NLM CIP)

National Library of Medicine's PubMed database (NLM PUBMED)

National Toxicology Program (NTP)

New Zealand's Chemical Classification and Information Database (CCID)

Organization for Economic Co-operation and Development Environment, Health, and Safety Publications Organization for Economic Co-operation and Development High Production Volume Chemicals Program

Organization for Economic Co-operation and Development Screening Information Data Set

World Health Organization

Revision date 05-June-2020

Revision Note No information available.

Disclaimer

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.

End of Safety Data Sheet



Certification of Compliance with current Good Manufacturing Practices

Dear Valued Customer:

Spectrum Chemical Mfg Corp certifies that the following product(s) is produced, processed, packaged and held in compliance with current Good Manufacturing Practices (cGMP) in accordance with the applicable parts of 21 CFR, parts 210 and 211 of the Code of Federal Regulations.

Catalog Number	Product Name
T4046	Tranexamic Acid, USP

Spectrum is an FDA registered and inspected Drug Establishment. Our United States Food and Drug Administration (USFDA) Registration numbers are as follows:

Spectrum-Gardena, CA: 2020632 Spectrum-New Brunswick, NJ: 2246824

Thank you for your interest in Spectrum products. If we may be of further assistance, please feel free to contact the Quality Assurance department at 310-516-8000 or via email at qualityassurance@spectrumchemical.com

Sincerely,

Oralia Chavez

Quality Assurance Specialist

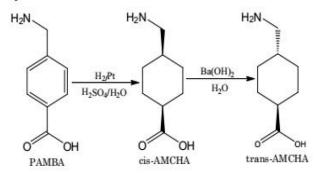
Order Clony



Manufacturing Process Flowchart

Tranexamic Acid, USP - T4046

Synthesis Route:



Brief description of the manufacturing process

The current manufacturing process of Tranexamic acid consists of three stages in sequence as follows:

- Hydrogenation of 4-aminomethylbenzoic acid, which is composed of two steps: hydrogenation, and filtration.
- Transformation from cis-Tranexamic acid to trans-Tranexamic acid, which is composed of five steps: cis-neutralization, trans-transformation, trans-neutralization, centrifugation, concentration and crystallization.
- Purification of crude Tranexamic acid, which is composed of refining, filtration, crystallization, centrifugation, washing, and drying.

CORPORATE HEADQUARTERS

769 Jersey Avenue New Brunswick, NJ 08901 PHONE 732.214.1300 FAX 732.246.7132 WEST COAST FACILITY

14422 South San Pedro Street
Gardena, California 90248
PHONE 310.516.8000
FAX 310.516.9843



T4046, Tranexamic Acid, USP

Source Statement

The above mentioned catalog item is manufactured by chemical synthesis. No animal or plant derived products are used in the manufacturing process.

BSE/TSE Statement

The above mentioned catalog item does not contain nor is manufactured using any animal derived products and is therefore, BSE/TSE free.

Allergen Statement

The above mentioned catalog item does not contain any of the following:

- Milk
- Egg
- Fish
- Shellfish
- Tree Nuts
- Wheat
- Peanuts
- Soy

- Cereals containing Gluten
- Celery
- Mustard
- Sesame Seed
- Corn
- Latex
- Sulfites > 10 ppm

EU Fragrance Allergen Statement

The above mentioned catalog item does not contain any of the 26 EU fragrance allergens listed in Annex III lines 67-92. These substances are not intentionally added to the following chemical and therefore are not expected to be present.

GMO Statement

The above mentioned catalog item is manufactured without the use of genetically modified organisms and is therefore GMO free.

Melamine Statement

The above mentioned catalog does not use or add melamine to the manufacturing process and is considered melamine-free.



Nitrosamine Statement

Based on knowledge of the manufacturing process, nitrosamine impurities are not known or suspected to be present in this material.

Animal Testing Statement

The above mentioned catalog item has not been tested on animals.

Organic Compliance Statement

The above mentioned catalog item has not been produced using GMOs, irradiation, ethylene oxide (EtO) or sewage sludge.

Shelf Life Statement

The above-mentioned catalog item is typically assigned a shelf life of 60 months from the date of manufacture. The actual assigned shelf life for any specific lot should be referenced on the Certificate of Analysis.

Other Chemicals Statement

Spectrum does not have any reason to suspect the above mentioned catalog item contains any of the following chemicals. This product does not come into contact with these chemicals during packaging or storage:

- Aflatoxins
- Antibiotics
- Bisphenol A (BPA)
- CMR Substances

- Parabens
- Pesticides
- Phthalates
- Preservatives



RE: Elemental Impurities- Tranexamic Acid, USP (Cat# T4046)

To Whom It May Concern:

Thank you for your interest in Spectrum high quality chemicals.

The above material complies with the USP<232>, <233> Elemental Impurities and the ICH Q3D Elemental Impurities Guideline. Per the current supply chain, the following elemental impurities are likely to be present:

Elemental Impurity		Class	Expected Concentration
Cadmium	Cd	1	<0.5 ppm
Lead	Pb	1	<0.5 ppm
Arsenic	As	1	<1.5 ppm
Mercury	Hg	1	<3.0 ppm
Cobalt	Со	2A	<5.0 ppm
Vanadium	V	2A	<10.0 ppm
Nickel	Ni	2A	<20.0 ppm
Platinum	Pt	2B	<10.0 ppm
Lithium	Li	3	<55.0 ppm
Antimony	Sb	3	<120 ppm
Barium	Ba	3	<140 ppm
Copper	Cu	3	<300 ppm

Other elemental impurities considered by USP <232>, <233> and ICH Q3D which are not addressed in the above mentioned table are not likely to be present. These substances are not used in the production process, are not intentionally added or known to be present in the above mentioned material.

This information is subject to change and is intended for risk assessment only. For lot-specific information, please refer to the respective Certificate of Analysis.

If you have any further questions, please contact us by telephone at 1(800)772-8786 Option 2, or by email at TechServices@spectrumchemical.com.

CORPORATE HEADQUARTERS

769 Jersey Avenue New Brunswick, NJ 08901 PHONE 732.214.1300 FAX 732.246.7132 WEST COAST FACILITY

14422 South San Pedro Street
Gardena, California 90248
PHONE 310.516.8000
FAX 310.516.9843



Sincerely,

Darlene Dagdag-Lyudmirskiy

Darbre Dagdag-Lyndmirskiy

Technical Services

Spectrum Chemical Mfg. Corp.

FAX 732.246.7132



RE: Residual Solvents - Tranexamic Acid, USP (Cat# T4046)

To Whom It May Concern:

Thank you for your interest in Spectrum high quality chemicals.

The Class 2 solvent, chlorobenzene, is present in the above mentioned material below the limit of 360 ppm. The Class 2 solvent, Xylene, is present in the above mentioned material below the limit of 2170 ppm. The Class 3 solvent, ethanol, is present in the above mentioned material below the limit of 5000 ppm. The other residual solvent, Ethyl propionate, is present in the above mentioned material below the limit of 5000 ppm.

These limit complies with the requirements of the USP <467> Residual Solvents and the ICH Q3C Residual Solvents Guideline.

No Class 1 or other solvents are used or produced in the manufacture of this product.

1) Tranexamic Acid, USP - T4046

If you have any further questions, please contact us by telephone at 1(800)772-8786 Option 2, or by email at TechServices@spectrumchemical.com.

Sincerely,

Rebekah J. White

Rebekah White

Technical Service Representative Spectrum Chemical Mfg. Corp.

CORPORATE HEADQUARTERS

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New Brunswick, NJ 08901

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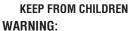
Label Information

The Spectrum label presents technical and safety information in an easily understood format. Our technical specialists stay abreast of the latest requirements of the Globally Harmonized System for Classification and Labelling of Chemicals (GHS), as well as the Occupational Safety and Health Administration (OSHA), the Food and Drug Administration (FDA) and other government regulatory agencies in order to ensure compliance, accuracy and concise hazard communication. Below you will find a typical label example for this catalog item.

WARNING • Causes serious eye irritation • Causes skin

irritation • May cause respiratory irritation.
• Wear protective gloves, eye protection, face protection • Avoid breathing dust • Use only outdoors or in a well-ventilated area • Wash face, hands and any

exposed skin thoroughly after handling.
FIRST AID: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists:
Get medical attention. IF ON SKIN: Wash with plenty of water. Take off contaminated clothing and wash it before reuse. If skin irritation occurs: Get medical attention. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER



Cancer and Reproductive Harmwww.P65Warnings.ca.gov

or physician if you feel unwell.

T4046

SIZ SY

Tranexamic Acid

[trans-4-(Aminomethyl)-cyclohexanecarboxylic Acid]

USP

CAS 1197-18-8

CAUTION: For manufacturing, processing, repacking, or for prescription compounding. Rx only.

Read and understand the label and Safety Data Sheet (SDS) prior to use.

Chemical Emergency: (800)424-9300

www.SpectrumChemical.com

C₈H₁₅NO₂ F.W. 157.21

Manufacturer/Supplier Code	
Assay (Dried Basis)MAXIMUM LIMITS	
Chloride Loss on Drying	
Residue on Ignition	
Organic Impurities:	0.10/
Tranexamic Acid Related Compound C	
Aminomethylbenzoic Acid	
cis-Tranexamic Acid	
Ditranexamic Acid Amine	
Any Individual Unspecified Impurity	
Total Impurities	
Elemental Impurities	
Residual Solvents	To pass test

Repackaged by Spectrum as:

G 2/K5GHS-A

Lot No. XQ####

Spectrum Chemical Mfg Corp

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