

SAFETY DATA SHEET

SECTION 1 - IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product Identifier

Product Name: TBE 10X

Product Number: EC-860

1.2 Relevant Identified Uses of the Substance/Mixture and Uses Advised Against

Investigational research by professional users

1.3 Details of the Supplier of the Safety Data Sheet

Manufacturer

National Diagnostics
305 Patton Drive
Atlanta, GA 30036
(404) 699-2121
(800) 526-3867
info@nationaldiagnostics.com

Agent

AGTC Bioproducts
Unit 4 Fleet Business Park
Itlings Lane, Hessle
East Riding of Yorkshire HU139LX
44(0) 1482 646020
office@agtcbioproducts.com

1.4 Emergency Telephone Number

Chemtrec

1-800 424-9300 (U.S. & Canada)
01-703-527-3887 (outside U.S. & Canada)

SECTION 2 - HAZARDS IDENTIFICATION

2.1 Classification of the Substance or Mixture

Classification according to Regulation (EC) No. 1272/2008 [EU-GHS/CLP]

H315 - Skin Corrosion/Irritation (Category 2)

H320 - Serious Eye Damage/Eye Irritation (Category 2B)

H335 - Specific Target Organ Toxicity, Single Exposure (Category 3)

2.2 Label Elements

GHS LABEL ELEMENTS AND CLASSIFICATION

GHS Label Elements



WARNING

H315 - Causes skin irritation.

H320 - Causes eye irritation.

H335 - May cause respiratory irritation.

P260 - Do not breathe dust/fumes/gas/mist/vapors/spray.

P264 - Wash skin thoroughly after handling.

P302+P352 - IF ON SKIN: Wash with plenty of soap and water.

P308+P313 - IF exposed or concerned: Call a POISON CENTER or doctor/physician.

2.3 Other Hazards

None found.

SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixture

Chemical Names/Description

Aqueous solution of buffer salts (EDTA < 1%)

Component List

Component	% Comp.	CAS #	EC #	1278/2008 Classification
Boric Acid	< 5.5	10043-35-3	233-139-2	H360
Tris-Base	10 - 15	77-86-1	201-064-4	H315, H319, H335
Ethylenediaminetetraacetic acid, disodium salt dihydrate	< 1.0	6381-92-6	205-358-3	H332

SECTION 4 - FIRST AID MEASURES

4.1 Description of First Aid Measures

Inhalation

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

Ingestion

Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Call a physician.

Skin

Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Eyes

Immediately flush eyes with plenty of water for at least fifteen minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

4.2 Most Important Symptoms and Effects, Both Acute and Delayed

Inhalation

Boric Acid:

May be absorbed from the mucous membranes of the respiratory tract, and depending on the amount of exposure could result in symptoms paralleling ingestion.

Tris-Base:

Coughing, shortness of breath.

Ethylenediaminetetraacetic acid, disodium salt dihydrate:

Symptoms may include coughing and shortness of breath.

Ingestion

Boric Acid:

Depending on the amount of exposure, ingestion could result in the development of nausea, vomiting, diarrhea, drowsiness, rash, headache, fall in body temperature, low blood pressure, renal injury, cyanosis, coma, and death. Adult fatal dose reported at 5 to > 30 grams.

Tris-Base:

Symptoms may include nausea, vomiting, and diarrhea. Large oral doses may cause weakness, collapse, blood clotting, and coma. The estimated lethal dose of Tris Base is 50 grams dry solid.

Ethylenediaminetetraacetic acid, disodium salt dihydrate:

Symptoms may include irritation and reddening to the mucous membranes of the mouth, esophagus, and gastrointestinal tract.

Skin

Boric Acid:

Symptoms of skin absorption parallel inhalation and ingestion.

Tris-Base:

Redness, itching, and pain.

Ethylenediaminetetraacetic acid, disodium salt dihydrate:

Symptoms may include irritation with redness and pain.

Eyes

Boric Acid:

Redness, itching and pain.

Tris-Base:

Redness, itching, and pain.

Ethylenediaminetetraacetic acid, disodium salt dihydrate:

Symptoms may include irritation, redness, pain, and corneal damage.

4.3 Indication of Any Immediate Medical Attention and Special Treatment Needed

Unknown/not applicable

SECTION 5 - FIRE FIGHTING MEASURES

5.1 Extinguishing media

Use media appropriate to the primary cause of fire.

5.2 Special Hazards Arising from the Substance/Mixture

Hazardous Combustion Products

Thermal decomposition products may include toxic oxides of nitrogen and carbon.

Hazardous Decomposition Products

Boric acid loses chemically combined water upon heating, forming metaboric acid (HBO₂) at 212 - 221F, then pyroboric acid (H₂B₄O₇) at 285 - 320F, and boric anhydride at higher temperatures. The burning of Tris Base may produce carbon monoxide, carbon dioxide, and nitrogen oxides.

Hazardous Polymerization

Will not occur under normal conditions of use (See Sections 10.4 & 10.5).

5.3 Advice for Firefighters

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.

5.4 Further Information

No data available.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

6.1 Personal Precautions

Wear appropriate protective equipment as specified in Section 8.

6.2 Environmental Precautions

Prevent discharge into the environment. Dike spills and stop leakage where practical. Do not allow material to enter drains.

6.3 Methods and Materials for Containment and Cleaning Up

Contain and clean up spill immediately, prevent from entering floor drains. Contain liquids using absorbents. Shovel all spill materials into disposal drum. Scrub spill area with detergent, flush with copious amounts of water.

6.4 References to Other Sections

For disposal information, see Section 13. For Protective clothing and equipment, see Section 8.

SECTION 7 - HANDLING AND STORAGE

7.1 Precautions for Safe Handling

Avoid contact and inhalation. Do not get in eyes, on skin, on clothing. Wash thoroughly after handling.

7.2 Conditions for Safe Storage (including any incompatibles)

Keep in a tightly closed container, stored in a cooled, dry, ventilated area.

Incompatibles

Boric Acid:

Potassium, acetic anhydride, alkalis, carbonates, and hydroxides.

Tris-Base:

No incompatibility data found.

Ethylenediaminetetraacetic acid, disodium salt dihydrate:

Oxidizing agents.

7.3 Specific End Uses

Investigational research by professional users

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PRECAUTIONS

8.1 Control Parameters

Component: Boric Acid

ACGIH Threshold Limit Value (TLV): 10 mg/m³ total dust

OSHA Permissible Exposure Limit (PEL): 15 mg/m³ total dust

Component: Tris-Base

ACGIH Threshold Limit Value (TLV): none established

OSHA Permissible Exposure Limit (PEL): none established

Component: Ethylenediaminetetraacetic acid, disodium salt dihydrate

ACGIH Threshold Limit Value (TLV): None Established

OSHA Permissible Exposure Limit (PEL): None established

8.2 Exposure Controls

Engineering Controls

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source.

Respiratory Protection

For conditions of use where exposure to the dust or mist is apparent, a full-face dust/mist respirator may be worn. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator.

Eye Protection

Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

Skin Protection

Wear protective gloves and clean body covering clothing.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on Basic Physical & Chemical Properties

a. Appearance	Clear, colorless solution	b. Odor	None
c. Odor Threshold	N.A.	d. pH	8.3
e. Melting/Freezing Point (°C)	0	f. Boiling point (°C)	104.4
g. Flash Point (°C)	N.A.	h. Evaporation Rate	1.0
i. Flammability	N.A.	j. Upper/Lower Flammability or Explosive Limits	N.A.
k. Vapor Pressure	Water	l. Vapor Density (Air = 1)	N.A.
m. Relative Density	1.16	n. Water Solubility	Soluble
o. Partition Coefficient n-octanol/water	Mixture	p. Autoignition Temperature (°C)	N.A.
q. Decomposition Temperature (°C)	N.A.	r. Viscosity	No data available.
s. Explosive Properties	N.A.	t. Oxidizing Properties	N.A.

SECTION 10 - STABILITY AND REACTIVITY

10.1 Reactivity

Not reactive under normal conditions of use and storage.

10.2 Chemical Stability

Stable under ordinary conditions of use and storage. If moisture is present, boric acid can be corrosive to iron.

10.3 Possibility of Hazardous Reactions

Will not occur under normal conditions of use (See Sections 10.4 & 10.5).

10.4 Conditions to Avoid

Heat, incompatibles.

10.5 Incompatible Materials

Boric Acid:

Potassium, acetic anhydride, alkalis, carbonates, and hydroxides.

Tris-Base:

No incompatibility data found.

Ethylenediaminetetraacetic acid, disodium salt dihydrate:

Oxidizing agents.

10.6 Hazardous Decomposition Products

Boric acid loses chemically combined water upon heating, forming metaboric acid (HBO₂) at 212 - 221F, then pyroboric acid (H₂B₄O₇) at 285 - 320F, and boric anhydride at higher temperatures. The burning of Tris Base may produce carbon monoxide, carbon dioxide, and nitrogen oxides.

SECTION 11 - TOXICOLOGICAL INFORMATION

Product LD50 Values

Oral Rat LD50 (mg/kg)

48364

Dermal Rabbit LD50 (mg/kg)

none established

Component Cancer List Status

	NTP Carcinogen		IARC Category
	Known	Anticipated	
Boric Acid	No	No	None
Tris-Base	No	No	None
Ethylenediaminetetraacetic acid, disodium salt dihydrate	No	No	None

Potential Health Effects

Inhalation

Boric Acid

Causes irritation to the mucous membranes of the respiratory tract.

Tris-Base

Causes irritation to the respiratory tract.

Ethylenediaminetetraacetic acid, disodium salt dihydrate

Causes irritation of the mucous membrane and upper respiratory tract.

Ingestion

Boric Acid

Harmful or fatal if ingested in sufficient volume.

Tris-Base

Causes irritation and reddening to the mucous membranes of the mouth, esophagus, and gastrointestinal tract.

Ethylenediaminetetraacetic acid, disodium salt dihydrate

Substance has low toxicity by ingestion. Large amounts may cause gastric upset due to osmotic imbalance through the sequestering of metal ions.

Skin

Boric Acid

Causes irritation to the skin.

Tris-Base

Causes irritation to the skin.

Ethylenediaminetetraacetic acid, disodium salt dihydrate

Causes skin irritation. Causes redness and pain.

Eyes

Boric Acid

Causes irritation to the eyes.

Tris-Base

Causes irritation to the eyes.

Ethylenediaminetetraacetic acid, disodium salt dihydrate

Causes eye irritation. Causes redness and pain.

Carcinogenicity

Boric Acid

Not listed as a carcinogen by NTP or IARC.

Tris-Base

Not listed as a carcinogen by NTP or IARC.

Ethylenediaminetetraacetic acid, disodium salt dihydrate

Not listed by NTP or IARC as a known or anticipated carcinogen.

Mutagenicity

Boric Acid

No information found.

Tris-Base

No information found.

Ethylenediaminetetraacetic acid, disodium salt dihydrate

Cytogenetic Analysis: intraperitoneal - mouse 50mmol/L. DNA Inhibition: hamster fibroblast 500ug/L, rabbit kidney 250 umol/L.

Reproductive Toxicity

Boric Acid

Studies of dogs and rats have shown that infertility and damage to testes can result from acute or chronic ingestion of boric acid. Evidence of toxic effects on the human reproductive system is inadequate.

Tris-Base

No information found.

Ethylenediaminetetraacetic acid, disodium salt dihydrate

Fertility: Post-implantation mortality, oral - rat TDLo = 7632 mg/kg.

Teratogenic Effects**Boric Acid**

No information found.

Tris-Base

No information found.

Ethylenediaminetetraacetic acid, disodium salt dihydrate

Embryo or Fetus: Stunted fetus, oral - rat TDLo = 7632 mg/kg. Specific developmental abnormalities: cardiovascular, craniofacial, musculoskeletal, respiratory, and urogenital, oral - rat TDLo = 7632 mg/kg.

Routes of Entry**Boric Acid**

Ingestion and inhalation. Not significantly absorbed through the intact skin. Readily absorbed through damaged or burned skin.

Tris-Base

Ingestion.

Ethylenediaminetetraacetic acid, disodium salt dihydrate

Inhalation, ingestion or skin contact.

Target Organ Statement**Boric Acid**

Persons with pre-existing skin disorders or eye problems, or impaired liver, kidney or respiratory function may be more susceptible to the effects of this substance.

Tris-Base

No information available.

Ethylenediaminetetraacetic acid, disodium salt dihydrate

No information available

SECTION 12 - ECOLOGICAL INFORMATION**12.1 Toxicity****COMPONENT: Boric Acid**

	Vertebrates	Invertebrates	Algae	Microorganisms
Aquatic Toxicity (ppm unless otherwise noted)	LC50 (Limanda limanda, 72hrs) 75mg/L	LC50 (48hr, Daphnia) 133mg/L	NOEC 50mg/L	EC50:(3hr) 175mg/L

	Birds	Arthropods	Plants	Microorganisms
Terrestrial Environment Toxicity (ppm unless otherwise noted)	No data	NOEC (21day, mortality) 175mg/kg soil	No data	EC50 24-250mg/L

COMPONENT: Tris-Base

	Vertebrates	Invertebrates	Algae	Microorganisms
Aquatic Toxicity (ppm unless otherwise noted)	LC50 460mg/l (Golden ide)	EC50: 59.8 mg/L (Daphnia)	EC50: 473mg/l @ 48 hrs	CE50>1000mg/L (3hrs)

	Birds	Arthropods	Plants	Microorganisms
Terrestrial Environment Toxicity (ppm unless otherwise noted)	No data	No data	No data	No data

COMPONENT: Ethylenediaminetetraacetic acid, disodium salt dihydrate

	Vertebrates	Invertebrates	Algae	Microorganisms
Aquatic Toxicity (ppm unless otherwise noted)	LC50 (96hr, Lepomis macrochirus):41mg/L	EC50 (485hr daphnia) 140mg/L	EC 50 (72hrs)>100mg/L	EC50>500mg/L

	Birds	Arthropods	Plants	Microorganisms
Terrestrial Environment Toxicity (ppm unless otherwise noted)	No data	No data	LOEC (Nicotiana tabacum) 420mg/L	No data

12.2 Persistence and Degradability

Boric Acid

No data

Tris-Base

Readily Biodegradable (>97% degradation at 28 days)

Ethylenediaminetetraacetic acid, disodium salt dihydrate

Biodegradable (55% degradation in 20 days)

12.3 Bioaccumulative Potential

Boric Acid

No data

Tris-Base

No data

Ethylenediaminetetraacetic acid, disodium salt dihydrate

BCF 1.1-1.8

12.4 Mobility in Soil

Boric Acid

logKp 0.34L/kg

Tris-Base

Log Koc 1.57-1.85

Ethylenediaminetetraacetic acid, disodium salt dihydrate

No data

12.5 Results of PBT and vPvB Assessment

Boric Acid

Does not apply (inorganic)

Tris-Base

Not a PBT or vPvB

Ethylenediaminetetraacetic acid, disodium salt dihydrate

Not PBT or vPvB

12.6 Other Adverse Effects

Boric Acid

None

Tris-Base

None

Ethylenediaminetetraacetic acid, disodium salt dihydrate

None

SECTION 13 - DISPOSAL CONSIDERATIONS

13.1 Waste Treatment Methods

Offer surplus or non-recyclable product to licensed disposal company. Disposal is subject to user compliance with applicable law and product characteristics at time of disposal. Dispose of packaging as product.

SECTION 14 - TRANSPORT INFORMATION

	ADR/RID	IATA	IMO	DOT
14.1 UN Number	N.A.	N.A.	N.A.	N.A.
14.2 Shipping Name	Not Regulated	Not Regulated	Not Regulated	Not Regulated
14.3 Hazard Class	N.A.	N.A.	N.A.	N.A.
14.4 Packing Group	N.A.	N.A.	N.A.	N.A.
14.5 Environmental Hazards	N.A.	N.A.	N.A.	N.A.
14.6 Special Precautions	N.A.	N.A.	N.A.	N.A.

SECTION 15 - REGULATORY INFORMATION

15.1 Safety, Health and Environmental Regulations/Legislation Specific for the Substance/Mixture

United States

TSCA Regulatory Statement

All intentional ingredients are listed on the TSCA Inventory.

SARA 311/312 Hazard Categories

Component	Fire	Pressure	Reactivity	Acute	Chronic
Boric Acid	No	No	No	Yes	Yes
Tris-Base	No	No	No	Yes	No
Ethylenediaminetetraacetic acid, disodium salt dihydrate	No	No	No	Yes	No

Europe

EEC Regulatory

All intentional ingredients are listed on the European EINECS Inventory.

SECTION 16 - OTHER INFORMATION

Revisional Updates

5/29/2015 - Updated Sections 2.1 and 3.2

8/19/2013 - Released Version 1.0

NFPA Codes

Health 1 Flammability 0 Reactivity 0

Dangers

Boric Acid

H360 - May damage fertility or the unborn child.

Tris-Base

H315 - Causes skin irritation.

H319 - Causes serious eye irritation.

H335 - May cause respiratory irritation.

Ethylenediaminetetraacetic acid, disodium salt dihydrate

H332 - Harmful if inhaled.

MANUFACTURER DISCLAIMER: The information given herein is offered in good faith as accurate, but without guarantee. Conditions of the use and suitability of the product for particular uses are beyond our control. All risks of use of the product are therefore assumed by the user. Nothing is intended as a recommendation for uses which infringe valid patents or as extending license under valid patents. Appropriate warnings and safe handling procedures should be provided to handlers and users.