



Material Safety Data Sheet


MSDS/SDS Number: 00000109MSDS
Latest Revision Date: March 11, 2011
Revision: A

SECTION 1 IDENTIFICATION OF THE SUBSTANCE OR PREPARATION AND OF THE COMPANY/UNDERTAKING

Product Name: TBS, 20X.
Catalogue Number(s): See Section 16.
Chemical Name: Aqueous solution of [2-amino-2-(hydroxymethyl)propane-1,3-diol hydrochloride], Sodium Chloride, Trometamol, and Sodium Hydroxide.
Synonyms: Rinse Buffer, 20X.
Intended Product Use: Intended for research use only.
Manufacturer/Distributor: Millipore Corporation (Corporate Headquarters) Millipore S.A.S. (European Headquarters)
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SECTION 2 HAZARDS IDENTIFICATION

Globally Harmonized System of Classification and Labeling of Chemicals (GHS):

Symbol:  **Hazard Category:** 2A: Serious Eye Damage/Eye Irritation
2: Skin Corrosion/Irritation

Signal Word: Warning

Hazard Statement: H315+320: Causes skin and eye irritation.

GHS Precautionary Statements:

Prevention: P264: Wash hands thoroughly after handling.
P281: Use personal protective equipment as required.


Response: P308+P313: If exposed or concerned: Get medical advice/attention.
P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P302+P352: IF ON SKIN: Wash with plenty of soap and water.

P362: Take off all contaminated clothing and wash before reuse.

Storage: P403+P233: Store in a well ventilated place. Keep container tightly closed.

Disposal: P501: Dispose of content/container in accordance with local regulations.

Registration, Evaluation, Authorization, and Restriction of Chemicals (REACH):

Symbol:  **Symbol Letter:** Xi

Hazard: Irritant

Risk Phrase: R36/38: Irritating to eyes and skin.

SECTION 3 COMPOSITION/INFORMATION ON INGREDIENTS

Identification of Dangerous Components: This product contains the substances listed below, which are defined as dangerous substances or hazardous chemicals as defined in European Community Directives 67/548/EEC or 1999/45/EC, and Hazard Communication Standard 29 CFR 1910.1200.

Dangerous Component	EINECS or ELINCS No.	CAS No.	Content (weight percent)	EU Hazard Symbol Letters*†	R Phrases** †
2-amino-2-(hydroxymethyl)propane-1,3-diol hydrochloride:	214-684-5	1185-53-1	10 - 20%	N/A	N/A
Sodium Chloride:	231-598-3	7647-14-5	10 - 20%	N/A	N/A
Trometamol:	201-064-4	77-86-1	< 1.0%	N/A	N/A
Sodium Hydroxide:	215-185-5	1310-73-2	< 0.1 %	C	R35

Identification of Components Not Classified as Dangerous: This product contains the substances listed below, which are not defined as dangerous substances or hazardous chemicals as defined in European Community Directives 67/548/EEC or 1999/45/EC, and Hazard Communication Standard 29 CFR 1910.1200.

Non-Dangerous Component	EINECS or ELINCS No.	CAS No.	Content (weight percent)	EU Hazard Symbol Letters *	R Phrases**
Water:	231-791-2	7732-18-5	< 80 %	N/A	N/A

* Symbol letters and categories of danger: **T+** = Very toxic, **T** = Toxic, **C** = Corrosive, **Xn** = Harmful, **Xi** = Irritant, **E** = Explosive, **F+** = Extremely flammable, **F** = Very flammable, **N** = Dangerous for the environment, **O** = Oxidising.

** The full text of each R phrase is listed in Section 15.

† Symbols letters and R Phrases are assigned to each dangerous component for the highest concentration range as defined in 67/548/EEC and 1999/45/EC.

SECTION 4 FIRST AID MEASURES

	Treatment Measures:	Symptoms of Exposure:
Contact with Eyes:	If the product contacts the eyes, promptly wash (irrigate) the eyes with large amounts of tepid water for at least 15 minutes, occasionally lifting the lower and upper lids. Seek medical attention immediately.	Possible eye irritation causing redness and lacramation.
Ingestion:	Seek medical attention immediately. Never give an unconscious person anything by mouth.	Possible gastrointestinal irritation causing nausea and vomiting.
Inhalation:	If a person inhales large amounts of the product move the exposed person to fresh air at once. If breathing is difficult or stops seek immediate medical attention.	Possible respiratory tract and mucous membrane irritation.
Skin Contact:	If the product contacts the skin, immediately flush the contaminated skin with mild soap and water. If this chemical penetrates clothing immediately remove the clothing and flush the skin with water. Seek medical attention immediately.	Possible skin irritation and dermatitis after repeated or prolonged skin contact.

SECTION 5 FIRE FIGHTING MEASURES

Suitable Extinguishing Media:	Use extinguishing media appropriate for the surrounding fire. This product is compatible with commercially available extinguishing media.
Special Protective Equipment for Firefighters:	This product does not require the use of any additional fire fighting equipment beyond what is appropriate to the surrounding fire.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Personal Precautions:	Wear chemical resistant boots, clothing, eye protection, and gloves to prevent skin contact (See Section 8).
Small Spills:	Identify the spilled material(s). Barricade the spill area and notify others in the surrounding areas. Control all sources of ignition if the substance is flammable. Don the appropriate personal protective equipment (See section 8). Control the movement of the spilled product (into drains, soil, across floors etc.) with absorbent spill materials. Collect contaminated spill material and place in container meeting appropriate U.N. packaging requirements. Decontaminate used equipment and affected spill area appropriately.
Large Spills:	In addition to small spill precautions, determine personnel evacuation distances. Notify appropriate authorities if necessary.
Environmental Precautions:	Collect and dispose of contaminated materials according to international, federal, state and local regulations. Keep away from surface and ground water, drains, and soil.

SECTION 7 HANDLING AND STORAGE

Handling: Seek appropriate training to safely handle this product under normal conditions. Use the recommended personal protective equipment (See Section 8) to prevent chemical exposures. Wash hands with soap and water before eating, drinking, or touching common items (phone, computer, etc.) to prevent cross contamination. Use this product with adequate ventilation. See product technical data sheet for details.

Storage: See product technical data sheet for details.

Specific Use: See product technical data sheet for details.

SECTION 8 EXPOSURE CONTROL AND PERSONAL PROTECTION

Exposure Limit Values:	OSHA PEL	NIOSH REL	ACGIH TLV	Other
2-amino-2-(hydroxymethyl)propane-1,3-diol hydrochloride:	Not Listed	Not Listed	Not Listed	None
Sodium Chloride:	Not Listed	Not Listed	Not Listed	See Below
Russia:	OEL (STEL) 5 mg/m ³ , JUN2003			
Trometamol:	Not Listed	Not Listed	Not Listed	See Below
Russia:	OEL (STEL) 5 mg/m ³ , JUN2003			
Sodium Hydroxide:	TWA 2 mg/m ³	Ceiling 2 mg/m ³	Ceiling 2 mg/m ³	See Below
Australia:	Ceiling 2 mg/m ³ , JUL2008			
Belgium:	TWA 2 mg/m ³ , MAR2002			
Denmark:	Ceiling 2 mg/m ³ , OCT 2002			
Finland:	TWA 2 mg/m ³ , JAN1999			
France:	VME 2 mg/m ³ , FEB2006			
Hungary:	TWA 2 mg/m ³ , STEL 2 mg/m ³ , SEP2000			
Japan:	OEL- Continuous 2 mg/m ³ , APR2007			
Korea:	Ceiling 2 mg/m ³ , 2006			
Mexico:	Peak 2 mg/m ³ , 2004			
The Netherlands:	MAC-TGG 2 mg/m ³ , 2003			
New Zealand:	Ceiling 2 mg/m ³ , JAN2002			
Norway:	TWA 2 mg/m ³ , JAN1999			
The Philippines:	TWA 2 mg/m ³ , JAN1993			
Poland:	MAC (TWA) 0.5 mg/m ³ , MAC(STEL) 1 mg/m ³ , JAN1999			
Sweden:	TWA 1 mg/m ³ , Ceiling 2 mg/m ³ (inhalable dust), JUN2005			
Switzerland:	MAK- week 2 mg/m ³ ,KZG- week 2 mg/m ³ , DEC2006			
Thailand:	TWA 2 mg/m ³ , JAN1993			
Turkey:	TWA 2 mg/m ³ , JAN1993			
United Kingdom:	STEL 2 mg/m ³ , 2005			

	Normal Handling Conditions	Emergency Response Conditions
Engineering Controls:	General room ventilation is adequate for the use of this product.	Provide negative pressure ventilation.
Respiratory Protection	Use appropriate respiratory protection.	Use appropriate respiratory protection.
Eye Protection:	Safety glasses with side shields.	Chemical splash goggles or other face protection as appropriate.
Skin Protection:	Laboratory coat, adequate chemical-resistant gloves.	Chemically resistant boots, clothes, and impermeable gloves as appropriate.
Environmental Exposure Controls:	Not available.	Not available.
Other Equipment:	Safety shower, eyewash stations, and hand washing equipment should be available close to the work area as needed.	

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Colorless to Slightly Yellow Liquid	
Odor:	None	
Odor Threshold:	None	
pH:	Not Available	
Melting Point/Freezing Point:	Essentially that of Water	
Initial Boiling Point and Boiling Range:	Essentially that of Water	
Flash Point:	Not Available	
Evaporation Rate, 20 °C:	Not Available	
Flammability (Solid/Gas):	Not Available	
Explosive Limits:	LEL: Not Available	UEL: Not Available
Vapor Pressure:	Not Available	
Vapor Density, 20 °C:	Not Available	
Relative Density (Water = 1.0):	Essentially that of Water	
Solubility:	Soluble	
Partition Coefficient (n-octanol/water):	Not Available	
Auto Ignition Temperature (ASTM D1929):	Not Available	
Decomposition Temperature:	Not Available	
Oxidizing Properties:	None	
Viscosity, Centipoise:	Not Available	

SECTION 10 STABILITY AND REACTIVITY

- Chemical Stability:** Product is stable under normal operating conditions and use as described in the product technical data sheet.
- Conditions to Avoid:** See product technical data sheet for details.
- Incompatible Materials to Avoid:** Strong acids or bases, strong oxidizers, and extreme temperatures.
- Hazardous Decomposition Products:** Heating to decomposition temperature may produce carbon monoxide, carbon dioxide, nitrogen oxides.

SECTION 11 TOXICOLOGICAL INFORMATION

Toxicology Data: Toxicological information for this product as a whole does not exist, below is data for the individual components.

Sodium Chloride: RTECS #VZ4725000

Trometamol: RTECS #TY2900000

Sodium Hydroxide: RTECS #WB4900000

	Toxicity Test	Exposure Route	Dose	Observed Effect
Acute Toxicity:				
2-amino-2-(hydroxymethyl)propane-1,3-diol hydrochloride:	Not Available			
Sodium Chloride:	LD ₅₀ (Rat)	Oral	3,000 mg/kg	N/A ¹
Trometamol:	LD ₅₀ (Rat)	Oral	5,900 mg/kg	N/A ²
	LD ₅₀ (Rat)	Intravenous	1,800 mg/kg	N/A ²
Sodium Hydroxide:	Lowest Published Lethal Dose (Human)	Oral	1.57 mg/kg	Behavioral: Anorexia (human) Nutritional and Gross Metabolic: Body temperature increase Skin: After topical application: Primary irritation ³
	Lowest Published Lethal Dose (Rabbit)	Oral	500 mg/kg	N/A ³
	Lowest Published Toxic Concentration (Rabbit)	Skin	25 pph	Behavioral: Food intake (animal) Nutritional and Gross Metabolic: Body temperature increase Skin: After topical application: Primary irritation ³
Skin Corrosion/Irritation:				
Sodium Chloride:	Skin Irritation (Rabbit)	Dermal	500 mg/24H	Mild ¹
Sodium Hydroxide:	Skin Irritation (Rabbit)	Skin	500 mg/24 hour	Severe ³

Serious Eye Damage/Eye Irritation:

Sodium Chloride:	Eye Irritation (Rabbit)	Eye	100 mg/24H	Moderate ¹
Sodium Hydroxide:	Eye Irritation (Rabbit)	Eye	1%	Severe ³

Respiratory or Skin Sensitization: Not Available

Germ Cell Mutagenicity: Not Available

Reproductive Toxicity: Not Available

STOST-Single Exposure: Not Available

STOST-Repeated Exposure: Not Available

Aspiration Hazard: Not Available

Carcinogenicity: Carcinogenetic information for this product as a whole does not exist, below is data for the individual components.

Research Agency:	OSHA:	NTP:	IARC:
2-amino-2-(hydroxymethyl)propane-1,3-diol hydrochloride:	Not Listed	Not Listed	Not Listed
Sodium Chloride:	Not Listed	Not Listed	Not Listed
Trometamol:	Not Listed	Not Listed	Not Listed
Sodium Hydroxide:	Not Listed	Not Listed	Not Listed

SECTION 12 ECOLOGICAL INFORMATION

Ecotoxicity: Ecotoxicity information for this product as a whole does not exist, below is data for the individual components.

2-amino-2-(hydroxymethyl)propane-1,3-diol hydrochloride: Not Available.

Sodium Chloride: LC₅₀ Carassius Auratus 24 Hours 9,900,000 ug/L⁴
 LC₅₀ Carassius Auratus 48 Hours 7,550,000 ug/L⁴
 LC₅₀ Carassius Auratus 96 Hours 7,000,000 ug/L⁴

Trometamol: No Response Selenastrum Capricornutum 96 Hours 200,000 ug/L⁵
 No Response Selenastrum Capricornutum 96 Hours 300,000 ug/L⁵

Sodium Hydroxide: LC₅₀ Gambusia Affinis 24 Hours 125,000 ug/L⁶
 LC₅₀ Gambusia Affinis 48 Hours 125,000 ug/L⁶
 LC₅₀ Gambusia Affinis 96 Hours 125,000 ug/L⁶

Mobility:

Trometamol: Terrestrial Fate: Based on a classification scheme, an estimated Koc value of 1, determined from a structure estimation method, indicates that tromethamine is expected to have very high mobility in soil. However, tromethamine has a pKa of 8.07 and should exist partially as a cation under environmental conditions (pH 5-9). As a result, tromethamine may have greater adsorption and less mobility than its estimated Koc value indicates since cations generally adsorb more strongly to soils containing organic carbon and clay than neutral species. Volatilization of

tromethamine from moist soil surfaces is not expected to be an important fate process since cations do not volatilize and the estimated Henry's Law constant for the neutral species is 8.7×10^{-13} atm-cu m/mole, using a fragment constant estimation method. Tromethamine is not expected to volatilize from dry soil surfaces based upon an estimated vapor pressure of 2.2×10^{-5} mm Hg, determined from a fragment constant method.⁷

Aquatic Fate: Based on a classification scheme, an estimated Koc value of 1, determined from a structure estimation method, indicates that tromethamine is not expected to adsorb to suspended solids and sediment. However, tromethamine has a pKa of 8.07 and should exist partially as a cation under environmental conditions (pH 5-9). As a result, tromethamine may have greater adsorption to suspended solids and sediment than its estimated Koc value indicates. Volatilization from water is not expected since cations do not volatilize and the estimated Henry's Law constant for the neutral species (free base) of tromethamine is 8.7×10^{-13} atm cu m/mol, calculated using a fragment constant estimation method. According to a classification scheme, an estimated BCF of 3, from an estimated log Kow of -1.56 and a regression-derived equation, suggests the potential for bioconcentration in aquatic organisms is low.⁷

Atmospheric Fate: According to a model of gas/particle partitioning of semivolatile organic compounds in the atmosphere, tromethamine, which has an estimated vapor pressure of 2.2×10^{-5} mm Hg at 25°C, determined from a fragment constant method, is expected to exist in both the vapor and particulate phases in the ambient atmosphere. Vapor-phase tromethamine is degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the half-life for this reaction in air is estimated to be 11 hours, calculated from its rate constant of 3.4×10^{-11} cu cm/molecule-sec at 25°C that was derived using a structure estimation method. Particulate-phase tromethamine is removed from the atmosphere by wet and dry deposition. Tromethamine does not contain chromophores that absorb at wavelengths >290 nm and therefore is not expected to be susceptible to direct photolysis by sunlight.⁷

Persistence and Degradation:

Trometamol: Environmental Biodegradation: Tromethamine yielded no oxygen uptake when incubated with pure cultures of different strains of bacteria, indicating biodegradation may be slow in the environment.⁷

Environmental Abiotic Degradation: The rate constant for the vapor-phase reaction of tromethamine with photochemically-produced hydroxyl radicals has been estimated as 3.4×10^{-11} cu cm/molecule-sec at 25°C, using a structure estimation method. This corresponds to an atmospheric half-life of about 11 hours at an atmospheric concentration of 5×10^5 hydroxyl radicals per cu cm. Tromethamine is not expected to undergo hydrolysis in the environment due to the lack of hydrolyzable functional groups. Tromethamine does not contain chromophores that absorb at wavelengths >290 nm and therefore is not expected to undergo direct photolysis by sunlight.⁷

Bio Accumulative Potential:

Trometamol: An estimated BCF of 3 was calculated for tromethamine, using an estimated log Kow of -1.56 and a regression-derived equation. According to a classification scheme, this BCF suggests the potential for bioconcentration in aquatic organisms is low.⁷

Results of PBT Assessment: Not Available.

Other Adverse Effects: None known.

SECTION 13 DISPOSAL INFORMATION

Substance: Dispose of unused contents in accordance with international, federal, state, and local regulations.

Contaminated Packaging: Dispose of container in accordance with international, federal, state and local requirements.

SECTION 14 TRANSPORTATION INFORMATION

UN Number: Not Listed.
Class: Not Listed.
Proper Shipping Name: Not Listed.
Packing Group: Not Listed.
Marine Pollutant: Not Listed.
Other Applicable Information: None.

SECTION 15 REGULATORY INFORMATION

Australia:	Hazchem Code: Not Listed.
	Poisons Schedule Number: Not Listed.
California:	Proposition 65 Listed: Not Listed.
Canada:	WHMIS: D2B.
European Union:	REACH: Chemical Safety Assessment for the substance or substances in the preparation not required.
	Substances of Very High Concern (SVHC) – January 13, 2010: This product does not contain SVHC's in concentrations above 0.1% weight/weight.
	Category of Danger: C: Corrosive. Xi: Irritant.
	Risk Phrases: R35: Causes severe burns. R36/38: Irritating to eyes and skin.
	Safety Phrases: S7/9: Keep container tightly closed and in a well-ventilated place. S20/21: When using do not eat, drink or smoke. S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S27/28: After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of soap and tepid water. S29/35: Do not empty into drains; dispose of this material and its container in a safe way. S36/37/39: Wear suitable protective clothing, gloves and eye/face protection. S45: In case of accident or if you feel unwell, seek medical advice immediately.
	OECD/High Production Volume (HPV) Chemicals: Sodium Chloride Trometamol, Sodium Hydroxide and Water.

RoHS: This product does not contain RoHS listed substances in concentrations above the established thresholds.

Japan: Poisonous and Deleterious Substances Control Law: Sodium Hydroxide: Deleterious Substance.

SECTION 16 ADDITIONAL INFORMATION

Product Number: Product Name:

20-190B TBS, 20X, 25 mL.
 20-190 TBS, 20X, 50 mL.
 20-190C TBS, 20X, 100 mL
 90218 Rinse Buffer 20X, 275 mL.
 20776 Rinse Buffer, 20X, 275 mL.
 21567 Rinse Buffer, 20X, 100 mL.
 20784 Rinse Buffer, 20X, 500 mL.

Component of Kit Number: Product Name:

ECM590 Blood Vessel Staining Kit
 ECM595 Blood Vessel Staining Kit, Alkaline Phosphatase conjugated
 DAB150-MS IHC Select[®] DAB Kit Single Species - Mouse 150 Tests
 DAB150-RB IHC Select[®] DAB Kit Single Species – Rabbit 150 Tests
 DAB150-GT IHC Select[®] DAB Kit Single Species –Goat 150 Tests
 DAB150-RT IHC Select[®] DAB Kit Single Species – Rat 150 Tests
 DAB050 IHC Select[®] HRP/DAB 50 TESTS
 DAB150 IHC Select[®] HRP/DAB150 TESTS
 DAB500 IHC Select[®] HRP/DAB 500 TESTS
 17-289 HAT Assay Kit
 17-289RF HAT Assay Kit (2-8°C)
 17-316 DNA Replication Assay Kit
 17-327 H2A.X Phosphorylation Assay Kit (Chemiluminescence Detection)
 17-327RF H2A.X Phosphorylation Assay Kit (Chemiluminescence Detection) (2-8°C)
 17-376 Nitrotyrosine ELISA
 17-376RF Nitrotyrosine ELISA (2-8°C)
 17-347 Anti-Citrulline (Modified) Detection Kit
 17-480 Phospho-FAK (Tyr397) STAR ELISA Kit
 17-480C STAR phospho-FAK(Tyr397) ELISA Kit (-80°C)
 17-480C-1 STAR phospho-FAK(Tyr397) ELISA Kit (2-8°C)
 17-490 ErbB2 (Tyr1248) Dual Detect CELISA Assay Kit (Fluorogenic Detection)
 17-491 ATF2 (Thr69/71) Dual Detect CELISA Assay Kit (Fluorogenic Detection)
 17-497 Ras Activation ELISA ASSAY Kit
 17-497RF Ras Activation ELISA ASSAY Kit (-20°C)
 17-720 H2A.X (Ser139) Dual Detect CELISA ASSAY Kit (Fluorogenic Detection)
 17-10006 Nitrotyrosine ELISA

- 17-10006-1 Nitrotyrosine ELISA (2-8°C)
 CSA001 Rho-associated Kinase (ROCK) Activity Assay
 CSA001-1 Rho-associated Kinase (ROCK) Activity Assay (2-8°C)

Training Advice: Seek effective chemical handling training to reduce the hazards associated with this product prior to use.

Technical Contact: <http://www.millipore.com/support>

Abbreviations Used	ACGIH	American Conference of Government Industrial Hygienists
	ADR	European agreement on the international carriage of dangerous goods on road
	CAS	Chemical Abstract Service
	EINECS	European Inventory of Existing Commercial Chemical Substances
	ELINCS	European List of Notified Chemical Substances
	EPA	United States Environmental Protection Agency
	IARC	International Agency for Research in Cancer.
	IATA	International Air Transport Association
	ICAO	International Civil Aviation Organization
	IMDG	Regulations regarding the transportation of dangerous goods on ocean-going vessels issued by the International Maritime Organization.
	LC ₅₀	Lethal Concentration 50% is the concentration of a chemical which kills 50% of a sample population
	LD ₅₀	Lethal Dose 50% is the dose of a chemical which kills 50% of a sample population.
	LDLo	Lowest observed lethal dose
	LEL	Lower Explosive Limit
	MSFU	Manufacture, Formulation, Supply and Use (Section 13)
	NIOSH	National Institute of Occupational Safety and Health (US)
	NTP	National Toxicology Program (US)
	OSHA	United States Occupational Safety and Health Administration
	RID	International regulations concerning the international carriage of dangerous goods by rail.
	RTECS	Registry of Toxic Effects of Chemical Substances (US)
	STOST	Specific Target Organ Systemic Toxicity
	UEL	Upper Explosive Limit
	WHMIS	Workplace Hazardous Materials Information System (Canada)

This safety data sheet has been prepared to comply with the requirements of the European Union regulation on the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) 1906/2006 and ANSI standard Z400.1-1998.

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¹ Centers for Disease Control and Prevention, 1600 Clifton Rd, Atlanta, GA 30333, USA, National Institute for Occupational Health and Safety (NIOSH), Registry of Toxic Effects of Chemical Substances (RTECS) File # VZ4725000, 2009.

² Centers for Disease Control and Prevention, 1600 Clifton Rd, Atlanta, GA 30333, USA, National Institute for Occupational Health and Safety (NIOSH), Registry of Toxic Effects of Chemical Substances (RTECS) File #TY2900000, 2009.

³ Centers for Disease Control and Prevention, 1600 Clifton Rd, Atlanta, GA 30333, USA, National Institute for Occupational Safety and Health (NIOSH), Registry of Toxic Effects of Chemical Substances (RTECS), File #WB4900000, 2009.

⁴ Adelman, I.R.Jr., Standard Test Fish Development. Part I. Fathead Minnows (*Pimephales promelas*) and Goldfish (*Carassius auratus*) as Standard Fish in Authors, EPA-600/3-76-061A, U.S.EPA, Duluth, MN :77 p., 1976.

⁵ Adams, N., K.H. Goulding, and A.J. Dobbs, Toxicity of Eight Water-Soluble Organic Chemicals to *Selenastrum capricornutum*: A Study of Methods for Calculating Toxic Values Using Different Growth Parameters, *Arch. Environ. Contam. Toxicol.* 14(3):333-345, 1985.

⁶ Wallen, I. E., W.C. Greer, and R. Lasater, Toxicity to *Gambusia affinis* of Certain Pure Chemicals in Turbid Waters, *Sewage Ind. Wastes* 29(6):695-711, 1957.

⁷ <http://toxnet.nlm.nih.gov/cgi-bin/sis/search/r?dbs+hsdb:@term+@m+@rel+77-86-1>, U.S. National Library of Medicine, 8600 Rockville Pike, Bethesda, MD 20894, 2009.