MATERIAL SAFETY DATA SHEET

PRODUCT AND COMPANY INFORMATION

Product Name: **50mM Sodium Citrate Buffer, pH 3.0**
Catalog Number: **CE-221**
Revision Date: 10/03/06

Company:
Protea Biosciences, Inc.
955 Hartman Run Road, #210
Morgantown, WV 26507 USA
304-292-2226 ● Fax: 304-292-7101
www.proteabio.com

COMPOSITION / INFORMATION ON COMPONENTS

- ***Chemical Characterization***
- ***Description:*** *Mixture of the substances below with non-hazardous additions.*

Listing of dangerous and non-hazardous components:			
CAS #	**Chemical Name**	**EC #**	**Percent**
7732-18-5	water	2317912	>99%
18996-35-5	Citric acid, monosodium salt, anhydrous	2427346	<1%
6132-04-3	Trisodium citrate dihydrate		<1%

HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW
Appearance: Colorless
Caution! May cause eye irritation and transient injury. May cause respiratory and digestive tract irritation.
Target organs: unknown
Ingestion: May produce vomiting, diarrhea, and erythroderma.
Inhalation: Causes effects similar to those of acute skin absorption.
Chronic: Prolonged or repeated eye contact may cause conjunctivitis.
Information pertaining to particular dangers for man and environment not applicable
Classification system
The classification was made according to the latest editions of the EU-lists.
NFPA ratings (scale 0 to 4)
Health = 0
Fire = 0
Reactivity = 0

FIRST AID MEASURES

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.
Skin: Immediately wash with water and soap and flush thoroughly.
Ingestion: Get medical aid. Wash mouth out with water.
Inhalation: Supply fresh; consult doctor in case of complaints.
Notes to Physician: Treat symptomatically and supportively.

FIRE FIGHTING MEASURES

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.
Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.
Flash Point: Not available.

Autoignition Temperature: Not available.
Explosion Limits, Lower: Not available.
Upper: Not available.
NFPA Rating: Not published.

ACCIDENTAL RELEASE MEASURES

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Use water spray to disperse the gas/vapor. Remove all sources of ignition. Provide ventilation. A vapor suppressing foam may be used to reduce vapors. Water spray may reduce vapor but may not prevent ignition in closed spaces.

HANDLING AND STORAGE

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Ground and bond containers when transferring material. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Do not ingest or inhale. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Use only with adequate ventilation. Keep away from heat, sparks and flame. Avoid use in confined spaces. Avoid breathing vapor or mist.
Storage: Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep containers tightly closed.

EXPOSURE CONTROL / PERSONAL PROTECTION

Engineering Controls: Use adequate ventilation to keep airborne concentrations low. The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
Exposure Limits:

Citric acid, monosodium salt, anhydrous (18996-35-5)	
PEL	1mg/m^3
Trisodium citrate dihydrate (6132-04-3)	
PEL	1mg/m^3

Personal Protective Equipment
Eyes: Wear chemical splash goggles.
Skin: Wear appropriate protective gloves to prevent skin exposure.
Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Liquid
Appearance: colorless
Odor: acidic
pH: 9.2 at 20 deg C.
Vapor Pressure: not available.
Vapor Density: Not available.
Evaporation Rate: Not available.
Boiling Point: 100 deg C
Freezing/Melting Point: Not available.
Decomposition Temperature: Not available.
Solubility: Fully miscible in water
Specific Gravity/Density: 1.000
Molecular Formula: Not available
Molecular Weight: Not available

STABILITY AND REACTIVITY

Chemical Stability: Stable under normal temperatures and pressures.
Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
Dangerous reactions: No dangerous reactions known.
Hazardous Decomposition Products: No dangerous decomposition products known.
Hazardous Polymerization: Will not occur.

TOXICOLOGICAL INFORMATION

Sodium Citrate Buffer
RTECS#:
CAS# 18996-35-5: GE7950000
CAS# 6132-04-3: unlisted

LD50/LC50:
CAS# 710049-21-5: unavailable
CAS# 6132-04-3: unavailable

Carcinogenicity:
CAS# 18996-35-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 6132-04-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: Potential eye, skin, and mucous membrane irritant

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

ECOLOGICAL INFORMATION

General Notes:
Water hazard class 1 (German Regulation) (self-assessment): slightly hazardous to water.
Do not allow undiluted product or large quantities of it to reach ground water, water course, or sewage system.

DISPOSAL CONSIDERATIONS

Product:
Recommendation: Hand over to hazardous waste disposers.

Uncleaned Packages:
Recommendation: Disposal must be made according to official regulations.
Recommended cleansing agent: Water, if necessary with cleansing agents.

TRANSPORT INFORMATION

DOT Regulations:
Hazard Class: non-hazardous – This substance is considered to be non-hazardous for transport.
Land transport ADR/RID (cross border):
ADR/RID Class: -
Maritime transport IMDG:
IMDG Class: -
Marine Pollutant: No
Air transport ICAO-TI and IATA-DGR:
ICAO/IATA Class: non-hazardous -- This substance is considered to be non-hazardous for air transport.

Transport / Additional information: Not dangerous according to the above specifications.

REGULATORY INFORMATION

US Federal

TSCA

CAS# 18996-35-5 is listed on the TSCA Inventory
CAS# 6132-04-3 is listed on the TSCA Inventory

SARA Reportable Quantities (RQ)

None of the components are on this list

CERCLA/SARA Section 313

None of the components are on this list

OSHA – Highly Hazardous

None of the components are on this list

US State

State Right to Know

CAS# 18996-35-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.
CAS# 6132-04-3 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

European/International Regulations

Canadian DSL/NDSL

CAS# 18996-35-5 is listed on Canada's DSL List
CAS# 6132-04-3 is listed on Canada's DSL List

Canada Ingredient Disclosure List

CAS# 18996-35-5 is not listed on Canada's Ingredient Disclosure List.
CAS# 6132-04-3 is listed on Canada's Ingredient Disclosure List.

OTHER INFORMATION

MSDS Creation Date: 10/03/2006
Revision #1 Date: 10/03/2006

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