TATE & LYLE
CONSISTENTLY FIRST IN RENEWABLE INGREDIENTS

MSDS No. D90127

MATERIAL SAFETY DATA SHEET

SECTION 1 CHEMICAL PRODUCTS & COMPANY IDENTIFICATION

Tate & Lyle
2200 E. Eldorado Street
Decatur, IL 62521

FOR EMERGENCY SOURCE INFORMATION
CHEMTREC: 800-424-9300

For Non-Emergency Product & MSDS Information: 217-421-4411
8 AM – 5 PM Central Daylight Savings Time

TRADE NAME: Tate & Lyle Citric Acid, Anhydrous, FCC, USP
SYNONYMS: None
SUBSTANCE: 2-Hydroxy-1,2,3 Propanetricarboxylic Acid
CAS NUMBER: 77-92-9

CREATED BY: Tate & Lyle
CREATION DATE: April 4, 2003 REVISION DATE: June 10, 2010

SECTION 2 HAZARDS IDENTIFICATION

ROUTES OF ENTRY: Inhalation; skin contact; eye contact.
POTENTIAL ACUTE HEALTH EFFECTS FROM OCCUPATIONAL EXPOSURE:
SKIN CONTACT: This product is irritating to the skin resulting in reddening, stinging, and swelling.
EYE CONTACT: This product is irritating to the eyes resulting in stinging, reddening, tearing, and swelling.
POTENTIAL CHRONIC EFFECTS OF EXPOSURE: No applicable information was found concerning any adverse chronic effects from overexposure to this product.
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Persons with pre-existing eye or skin disorders may be more susceptible to the effects of this product.

CARCINOGEN STATUS:
OSHA: Not listed.
NTP: Not listed.
IARC: Not listed.

SECTION 3 COMPOSITION/INFORMATION ON INGREDIENTS

COMPONENT	CASRN	WEIGHT %
2-Hydroxy-1,2,3 Propanetricarboxylic Acid	77-92-9	> 99.5

SECTION 4 FIRST AID MEASURES

EYE CONTACT: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.
SKIN CONTACT: In case of contact, remove contaminated clothing and flush skin with plenty of water for at least 15 minutes. Wash clothing before reuse. Call a physician.
INHALATION: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
INGESTION: If swallowed, call a physician.

SECTION 5 FIREFIGHTING MEASURES

FIRE AND EXPLOSION HAZARD: Dust can form explosive mixtures with air. It is recommended that all dust control equipment and material transport systems involved are engnineered to prevent conditions contributing to dust explosions. Do not allow dust to accumulate on flat surfaces, on rafters, or building structural components. See NFPA 61, Standard for the Prevention of Fire and Dust Explosions in Agricultural and Food Processing Facilities, 2008 Edition, and other related standards.
EXTINGUISHING MEDIA: Water; dry chemical; carbon dioxide. Use of water jet may cause explosive dust conditions.
FIREFIGHTING: Wear self-contained breathing apparatus and full protective gear. Protect against potentially toxic and irritating fumes. Use water spray to cool fire exposed containers.
FLAMMABILITY CLASS (OSHA): Not applicable.
HAZARDOUS COMBUSTION PRODUCTS: Carbon dioxide, carbon monoxide and other potentially toxic fumes.

SECTION 6 ACCIDENTAL RELEASE MEASURES

OCCUPATIONAL SPILL: Vacuum or sweep up spills and place in disposal container. Minimize dust generation.
WASTE DISPOSAL METHOD: Cover with soda ash or sodium bicarbonate to neutralize. Mix and add water if necessary. Scoop up slurry and dispose in accordance with existing federal, state, and local environmental control regulations.

SECTION 7 HANDLING AND STORAGE

STORAGE: Store in a dry place away from excessive heat in original or similar waterproof containers.
HANDLING: Avoid breathing dust. Avoid contact with eyes and skin. Wash thoroughly after handling. Avoid air conveying of powdered product due to potential of static buildup. Reseal containers immediately after use.

MAXIMUM STORAGE TEMPERATURE: 405 °F (224 °C) (product deteriorates).

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE LIMITS:

Nuisance Dust (also called Particulate Not Otherwise Regulated (PNOR))

OSHA PEL :
Total 15 mg/M^3
Respirable 5 mg/M^3

ACGIH Guideline:
Not applicable

VENTILATION: See NFPA 61, Standard for the Prevention of Fire and Dust Explosions in Agricultural and Food Processing Facilities, 2008 Edition. Normal industrial hygiene measures should be sufficient for protection of employees from exposure to dusts. Local and mechanical exhaust is desirable when dumping bags.
EYE PROTECTION: Chemical safety goggles.
SKIN PROTECTION: Rubber or vinyl gloves and long sleeved shirts and pants to minimize skin contact. Employees should wash their hands and face before eating, drinking, or using tobacco products.
RESPIRATOR: Ambient work area concentrations should be monitored and if the recommended exposure limit is exceeded, a NIOSH approved dust respirator should be worn.
EMERGENCY WASH FACILITIES: Emergency showers and eye wash stations should be made available. Educate and train employees in the safe use and handling of this product.
FOR FIREFIGHTING AND OTHER IMMEDIATELY DANGEROUS TO LIFE OR HEALTH CONDITIONS: See section 5.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

DESCRIPTION: White granual to fine granular crystalline product or powder.
ODOR: Odorless with a strong acid taste.
MOLECULAR WEIGHT: 192.13.
MOLECULAR FORMULA: $C_6H_8O_7$.
BOILING POINT: Not applicable.
MELTING POINT: 307 ºF (153 ºC).
FLASH POINT: Not applicable.
AUTO-IGNITION TEMPERATURE: Not available.
FLAMMABLE LIMITS: LEL: Not available; UEL: Not available.
VAPOR PRESSURE: Not applicable.
VAPOR DENSITY: Not applicable.
SPECIFIC GRAVITY: Not applicable.

SOLUBILITY (WATER): 59.2 g/100g at 68 ºF (20 ºC).
SOLUBILITY (METHYL ALCOHOL): 197 g/100g at 66.2 ºF (19 ºC).
PERCENT, VOLATILE BY WEIGHT (%) MOISTURE: Not more than 0.5.
BULK DENSITY:

LOOSE BULK DENSITY	(LB/FT3)
Granular	56
Fine	54
Powder	32

pH: Not available.
VISCOSITY: Not applicable.

SECTION 10 STABILITY AND REACTIVITY

STABILITY: Stable.
CONDITIONS TO AVOID: Avoid storage temperatures above 405 ºF (207 ºC) (product deteriorates).
INCOMPATIBILITIES: Reaction with caustic can create heat (strong exotherm). Solutions are mildly corrosive to carbon.
HAZARDOUS DECOMPOSITION PRODUCTS: In case of fire CO, CO_2 and other potentially toxic fumes.
POLYMERIZATION: Will not occur.

SECTION 11 TOXICOLOGY INFORMATION

POTENTIAL ACUTE HEALTH EFFECTS FROM OCCUPATIONAL EXPOSURE:
SKIN CONTACT: This product is irritating to the skin resulting in reddening, stinging, and swelling.
EYE CONTACT: This product is irritating to the eyes resulting in stinging, reddening, tearing, and swelling.
POTENTIAL CHRONIC EFFECTS OF EXPOSURE: No applicable information was found concerning any adverse chronic effects from overexposure to this product.
ANIMAL TOXICITY DATA: No animal toxicity information available.

SECTION 12 ECOLOGICAL INFORMATION

ACUTE AQUATIC TOXICITY: No data.
DEGRADABILITY: No data.
BIOCONCENTRATION FACTOR (BCF): No data.
OCTANOL/WATER PARTITION COEFFICIENT: No data.

SECTION 13 DISPOSAL INFORMATION

Follow local, state and federal regulations for product disposal. If discarded in its purchased form, this product would not be considered a hazardous waste either by listing or by characteristic. However, under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste. (40 CFR 261.20-24).

SECTION 14 TRANSPORTATION INFORMATION

TECHNICAL SHIPPING NAME: Organic Acid.
FREIGHT CLASS (BULK): Chemicals, NOI.
FREIGHT CLASS (PACKAGE): Chemicals, NOI, (NMFC 60000).
PRODUCT LABEL: Tate and Lyle Citric Acid, Anhydrous, FCC, USP.

DOT (HM-181) CLASSIFICATION (DOMESTIC SURFACE): Not regulated.
IMO (IMDG CODE) CLASSIFICATION (OCEAN): Not regulated.
ICAO / IATA CLASSIFICATION (AIR): Not regulated.

SECTION 15 REGULATORY INFORMATION

US FEDERAL REGULATIONS:
CLEAN AIR ACT: ODS: Not applicable.
TSCA STATUS: On TSCA Inventory.
CERCLA REPORTABLE QUANTITY: None.
SARA REPORTABLE QUANTITY: Exempt from SARA Title III reporting; contains no section 313 toxic chemical. It may contain up to the FCC limits for arsenic (1 ppm), lead (0.5 ppm), and heavy metals (5 ppm, as lead).
FDA STATUS: Citrus acid, Anhydrous complies with FDA Regulation 21 C.F.R. § 184.1033; EINECS No. 2010691; CAS No. 77-92-9. Citric acid is a non-toxic chemical registered as an EC Food Additive (E330) with intake limited by GMP (FAO/WHO). In the USA, the product has been registered as GRAS by tthe FDA and Quantum Satis in EC Legislation.

STATE REPORTING REQUIREMENTS:
CALIFORNIA PROPOSITION 65: Not applicable.
The following chemicals are specifically listed by individual states; other product specific health and safety data in other sections of the MSDS may also be applicable for state requirements. For details on your regulatory requirements, you should contact the appropriate agency in your state.

COMPONENT	CASRN	Concentration	STATE CODE
2-Hydroxy-1,2,3 Propanetricarboxylic Acid	77-92-9	100%	NJ4, PA3

NJ4 = New Jersey Other - included in 5 predominant ingredients > 1%.
PA3 = Pennsylvania: Non-hazardous, present at 3% or greater.

HMIS RATINGS:	0 = Minimal
HEALTH: 1	1 = Slight
FLAMMABILITY: 0	2 = Moderate
REACTIVITY: 0	3 = Serious
	4 = Severe

Method of hazard communication is comprised of Product Labels and Material Safety Data Sheets. HMIS ratings are provided as a customer service.

SECTION 16 OTHER