MATERIAL SAFETY DATA SHEET

1. Product and Company Identification

Material name	**CITRIC ACID MONOHYDRATE**
Version #	04
Revision date	10-25-2011
CAS #	5949-29-1
Product Codes	**J.T.Baker: 0110, 0115, 0116, 0117, 0118, 0119, 0120** **Macron: 0616, 0627, 11213, 7788**
Synonym(s)	1,2,3-PROPANETRICARBOXYLIC ACID, 2-HYDROXY-, HYDRATE (1:1)
Manufacturer	Avantor Performance Materials, Inc.
Address	3477 Corporate Parkway Suite #200 Center Valley, PA 18034 US
Customer Service	855-282-6867
24 Hour Emergency	908-859-2151
Chemtrec	800-424-9300

2. Hazards Identification

Emergency overview

DANGER

Contact will irritate or burn eyes. Irritating to respiratory system and skin.

OSHA regulatory status

This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).

Potential health effects

Routes of exposure	Inhalation. Skin contact. Eye contact. Ingestion.
Eyes	Severely irritating, and may seriously damage eye tissue.
Skin	Causes skin irritation.
Inhalation	Inhalation of dusts may cause respiratory irritation.
Ingestion	Expected to be a low ingestion hazard. May cause irritation of the gastrointestinal tract.
Target organs	Eyes. Skin. Upper respiratory tract.
Chronic effects	None known.
Potential environmental effects	The product components are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

3. Composition / Information on Ingredients

Components	CAS #	Percent
CITRIC ACID MONOHYDRATE	5949-29-1	99 - 100

Composition comments

CAS # 5949-29-1 can be described by the CAS # 77-92-9.

4. First Aid Measures

First aid procedures

Eye contact	Immediately flush with plenty of water for at least 15 minutes. If easy to do, remove contact lenses. Get medical attention immediately.
Skin contact	Immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if irritation develops or persists.
Inhalation	Move to fresh air. Treat symptomatically. Call a physician if symptoms develop or persist.

Ingestion	Drink plenty of water. Seek medical advice. If ingestion of a large amount does occur, call a poison control center immediately.
Notes to physician	Treat symptomatically.
General advice	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance.

5. Fire Fighting Measures

Flammable properties	Dust may form explosive mixture with air.
Extinguishing media	
Suitable extinguishing media	Water. Carbon dioxide (CO2). Dry chemical.
Unsuitable extinguishing media	None known.
Protection of firefighters	
Protective equipment and precautions for firefighters	Firefighters should wear full protective gear. Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask.
Special protective equipment for fire-fighters	As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.
Specific methods	In the event of fire, cool tanks with water spray. In the event of fire and/or explosion do not breathe fumes.
Hazardous combustion products	Carbon monoxide and carbon dioxide.

6. Accidental Release Measures

Personal precautions	Keep unnecessary personnel away. Keep upwind. Ventilate the area. Avoid inhalation of dust from the spilled material. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
Environmental precautions	Prevent further leakage or spillage if safe to do so.
Methods for containment	ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). If sweeping of a contaminated area is necessary use a dust suppressant agent which does not react with the product. Prevent entry into waterways, sewer, basements or confined areas.
Methods for cleaning up	Avoid dust formation. Small Spills: Sweep up or vacuum up spillage and collect in suitable container for disposal. Large Spills: Collect dust or particulates using a vacuum cleaner with a HEPA filter. Reduce airborne dust and prevent scattering by moistening with water. Never return spills in original containers for re-use. Clean contaminated surface thoroughly. Clean up in accordance with all applicable regulations.

7. Handling and Storage

Handling	Keep formation of airborne dusts to a minimum. Dust may form explosive mixture with air. Avoid heat, sparks, open flames and other ignition sources. Avoid breathing dust. Do not get in eyes and avoid contact with skin and clothing. Use only with adequate ventilation. Wash thoroughly after handling. Keep container closed. Wear appropriate personal protective equipment. See Section 8 of the MSDS for Personal Protective Equipment.
Storage	Keep containers tightly closed in a dry, cool and well-ventilated place.

8. Exposure Controls / Personal Protection

Exposure guidelines	Not established.
Engineering controls	Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Personal protective equipment

Eye / face protection	Wear safety glasses with side shields (or goggles) and a face shield.
Skin protection	Wear appropriate chemical resistant clothing. Wear appropriate chemical resistant gloves.
Respiratory protection	If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. Respirator type: High-efficiency particulate respirator with full facepiece.
General hygeine considerations	Provide eyewash station and safety shower. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical & Chemical Properties

Appearance	Granular.
Color	White.
Odor	Odorless.
Odor threshold	Not available.
Physical state	Solid.
Form	Powder.
pH	2.2 (0.1 N Solution)
Melting point	275 - 305.6 °F (135 - 152 °C)
Freezing point	275 - 305.6 °F (135 - 152 °C)
Boiling point	Decomposes
Flash point	Not available.
Evaporation rate	Not available.
Flammability limits in air, upper, % by volume	Not available.
Flammability limits in air, lower, % by volume	Not available.
Vapor density	Not available.
Specific gravity	1.542
Relative density	Not available.
Solubility (water)	Soluble
Partition coefficient (n-octanol/water)	Not available
Auto-ignition temperature	1850 °F (1010 °C)
Molecular weight	210.14 g/mol
Molecular formula	C6-H10-O8

10. Chemical Stability & Reactivity Information

Chemical stability	Stable under normal temperature conditions.
Conditions to avoid	Avoid dust formation. Excessive heat. Exposure to moisture.
Incompatible materials	Strong oxidizing agents.
Hazardous decomposition products	Carbon Dioxide. Carbon monoxide.
Possibility of hazardous reactions	Hazardous polymerization does not occur.

11. Toxicological Information

Toxicological data

Product	Test Results
CITRIC ACID MONOHYDRATE (5949-29-1)	Acute Oral LD50 Rat: 6730 mg/kg

Sensitization Not a skin sensitizer.

Local effects Severe eye irritation. May cause burns. Irritating to respiratory system and skin.

Chronic effects None known.

Carcinogenicity This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

Skin corrosion/irritation Causes skin irritation.

Epidemiology No epidemiological data is available for this product.

Mutagenicity No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Neurological effects None known.

Reproductive effects Contains no ingredient listed as toxic to reproduction

Teratogenicity No data available to indicate product or any components present at greater than 0.1% may cause birth defects.

Symptoms and target organs Irritant effects.

12. Ecological Information

Ecotoxicological data

Product	Test Results
CITRIC ACID MONOHYDRATE (5949-29-1)	LC50 Green or Europeon shore crab (Carcinus maenas): 160 mg/l 48.00 hours

Ecotoxicity This product has no known eco-toxicological effects.

Environmental effects Ecological injuries are not known or expected under normal use. An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Persistence and degradability This material is readily biodegraded and is not likely to bioconcentrate.

Partition coefficient (n-octanol/water) Not available

13. Disposal Considerations

Disposal instructions Dispose of contents/container in accordance with local/regional/national/international regulations.

Contaminated packaging Offer rinsed packaging material to local recycling facilities. Since emptied containers retain product residue, follow label warnings even after container is emptied.

14. Transport Information

DOT

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

15. Regulatory Information

US federal regulations

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
CERCLA/SARA Hazardous Substances - Not applicable.

This product is not listed on the U.S. EPA TSCA Inventory. Under TSCA, hydrates are considered mixtures of their anhydrous salt and water. Accordingly, the anhydrous form is subject to TSCA reporting requirements.

CERCLA (Superfund) reportable quantity

None

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories

Immediate Hazard - Yes
Delayed Hazard - No
Fire Hazard - No
Pressure Hazard - No
Reactivity Hazard - No

Section 311 hazardous chemical

Yes

Food and Drug Administration (FDA)

Total food additive
Direct food additive
GRAS food additive

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	No

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

State regulations

This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

Saf-T-Data

Health: 1 - Slight
Flammability: 2 - Moderate
Reactivity: 1 - Slight
Contact: 3 - Severe
Lab Protective Equip: D - GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: G - Green (General Storage)

16. Labeling Info

Label Hazard Warning

DANGER

Contact will irritate or burn eyes. Irritating to respiratory system and skin.

Label Precautions	Keep away from heat, sparks and flame. Avoid breathing dust. Do not get in eyes and avoid contact with skin and clothing. Use only with adequate ventilation. Wash thoroughly after handling. Keep container closed.
Label First Aid	Immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention. Flush skin thoroughly with water. If gas/fume/vapor/dust/mist from the material is inhaled, remove the affected person immediately to fresh air. Get medical attention if irritation develops or persists. If ingestion of a large amount does occur, call a poison control center immediately.

17. Other Information

NFPA ratings	Health: 2 Flammability: 1 Instability: 0
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