1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name: CITRIC ACID ANHYDROUS / MONOHYDRATE

Company Name: Amtrade International Pty Ltd (ABN 49 006 409 936)

Address: Level 6, 574 St Kilda Road
Melbourne
VIC. 3004  Australia

Emergency Tel.: 1800 033 111 Aust

Telephone/Fax Number:
Tel: 61 3 9229 9229
Fax: 61 3 9229 9290

Email: library@amtrade.com.au

Recommended Use: Preparation of citrates, flavouring extracts, confections, soft drinks, effervescent salts; acidifier; dispersing agent; medicines; acidulant and anti-oxidant in foods; abscission of citrus fruits in harvesting; cultured dairy products.

Product Code Name
310150 Citric Acid Anhyd. BBCA 10-40 Mesh 25kg
392375 Citric Acid Anhyd. YUB 30-100 Mesh 500kg
392910 Citric Acid Anhyd. YUB 16-40 Mesh 500kg
355429 Citric Acid Anhyd. YUB 16-40 Mesh 25kg
354406 Citric Acid Anhyd. YUB 30-100 Mesh 25kg
371440 Citric Acid Anhyd. BP98 30-80 mesh 25kg
394998 Citric Acid Anhyd. 25kg WE 30-100 Mesh
395544 Citric Acid Anhyd. 25kg WE 10-40 Mesh
379387 Citric Acid Anhyd. YUB Fine Powder 25kg
379212 Citric Acid Anhyd. (RZBC Fine) 25kg
394246 Citric Acid Anhyd. BP98 (RZBC) 25kg
370533 Citric Acid Anhyd. BP98 25kg
390160 Citric Acid Monohydrate BP2004 25kg
392049 Citric Acid Monohydrate 25kg (Sx)
392048 Citric Acid Monohydrate 25kg
363340 Citric Acid Monohydrate YUB 25kg
390160 Citric Acid Monohydrate BP2004 25kg
394246 Citric Acid Monohydrate 25kg (Sx)
360000 Citric Acid Monohydrate 25kg
390160 2-Hydroxy-1,2,3-Propanetricarboxylic Acid.

2. HAZARDS IDENTIFICATION

Hazard Classification: Workplace Hazardous Substance.
HAZARD CATEGORY: IRRITANT
Irritating to eyes, respiratory system and skin.
Not a Dangerous Good nor Scheduled Poison.

Other Information: Where fine, dry (anhydrous) powder is present it may form an explosive organic dust cloud in air.
There may be a harmful aquatic effect from large spills, due to pH shift in the water body.

3. COMPOSITION/INFORMATION ON INGREDIENTS
Material Safety Data Sheet

Product Name: CITRIC ACID ANHYDROUS / MONOHYDRATE

**Chemical Characterization**

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citric Acid Monohydrate</td>
<td>5949-29-1</td>
<td>&gt;99%</td>
</tr>
<tr>
<td>Water Content from the Monohydrate</td>
<td>7732-18-5</td>
<td>7.5-9 %</td>
</tr>
<tr>
<td></td>
<td>or</td>
<td></td>
</tr>
<tr>
<td>Citric Acid Anhydrous</td>
<td>77-92-9</td>
<td>&gt;99%</td>
</tr>
<tr>
<td>Water</td>
<td>7732-18-5</td>
<td>&lt;0.5%</td>
</tr>
</tbody>
</table>

**Other Information**

* Typically 8.4-8.8% moisture in the monohydrate.

**4. FIRST AID MEASURES**

- **Inhalation:** Remove victim to fresh air. Keep at rest. Seek medical advice if effects persist.
- **Ingestion:** Rinse mouth with water. Give plenty to drink. If vomiting occurs give further water. Seek medical advice.
- **Skin:** Wash contaminated skin with plenty of water. If irritation occurs, seek medical advice.
- **Eye:** Irrigate with copious quantities of water for 15 minutes. In all cases of eye contamination it is a sensible precaution to seek medical advice.

**First Aid Facilities**

Safety shower, eye wash plus normal washroom facilities nearby.

**Advice to Doctor**

Treat symptomatically.

Citric Acid elevates antibiotic blood levels of Tetracyclines through enhanced absorption of the Tetracycline Hydrogen Chloride salt.

**5. FIRE FIGHTING MEASURES**

- **Fire Fighting Measures:** Combustible. Will melt, decompose and burn under fire conditions.
  - Fine, dry (anhydrous) powders may form an explosive organic dust cloud.
  - **EXTINGUISHING MEDIA:** Any, choose for the surrounding area.
  - Water, Carbon Dioxide, Foam, Powder.
  - **PROTECTIVE EQUIPMENT:** Wear Self Contained Breathing Apparatus under fire conditions. Wear suitable protective clothing to avoid skin and eye contact.

**Decomposition Temp.**

175°C approx. (starts decomposing)

**6. ACCIDENTAL RELEASE MEASURES**

- **Emergency Procedures:** SPILLAGE: Clean up personnel may require protective equipment. Remove any ignition sources. Sweep up and shovel into clean, labelled containers. Avoid dust dispersal and dust cloud formation. Wash remaining residues to sewer. Prevent run-off from entering watercourses.

**7. HANDLING AND STORAGE**

- **Handling and Storage:** HANDLING: Avoid eye contact and repeated or prolonged skin contact. Wear protective equipment. Avoid formation of fine, dry (anhydrous) powders which may form an explosive organic dust cloud in air.
  - STORAGE: Store in a cool, well ventilated, dry area. Store away from sources of heat, strong alkalis, and strong oxidizing agents. Keep tightly closed.

**8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

- **National Exposure Standards:** No exposure standard has been established by the Australian Safety & Compensation Council (formerly NOHSC).
  - All atmospheric contamination should be kept to as low a level as is
practically possible. Nuisance Dusts 10 mg/m³ TWA (inspirable dust).

Engineering Controls
Normal dilution ventilation. Avoid generating and inhaling dusts. Keep containers closed when not in use.

Where fine, dry (anhydrous) powder is present it may form an explosive organic dust cloud in air. Evaluate handling equipment for ignition sources and this situation.

Personal Protective Equipment
Avoid eye contact and repeated or prolonged skin contact.
Wear impervious gloves (good - nitrile or neoprene; fair - rubber or latex).
Wear chemical goggles, face shield or safety glasses with side shields.
Wear protective overalls to avoid skin contact.
Consider applying a skin-protective barrier cream.
Always wash hands before smoking, eating, drinking or using the toilet.

9. PHYSICAL AND CHEMICAL PROPERTIES

Form Solid
Appearance Colourless, odourless, translucent crystals or powder, strongly acid taste.
The Anhydrous material is hygroscopic (absorbs moisture) in 50% RH air.
The Monohydrate is efflorescent (loses hydrated water) in dry air.
Decomposition Temperature 175°C approx. (starts decomposing)
Melting Point 135-152°C (Monohydrate)
151-154°C (Anhydrous)
Boiling Point Decomposes before boiling
Specific Gravity 1.54 (Monohydrate)
1.66-1.67 (Anhydrous)

pH Value 1.7 (10% at 20°C)
1.85 (5% at 20°C)
2.2 (0.1 M sol'n as citric acid, anhydrous)

Vapour Pressure <0.1 hPa
Volatile Component <1% at 20°C
The Monohydrate loses up to 9% moisture in dry air or when heated.
Flash Point Not applicable
Flammability Anhydrous form is Combustible.
The Monohydrate form is not readily combustible.
Both will burn under fire conditions.
The anhydrous powder may form an explosive organic dust cloud in air.
Auto-Ignition Temperature 345°C (Anhydrous form)
Flammable Limits - Lower Fine, dry powder may form an explosive organic dust cloud in air.

Explosion Properties LEL (dust): 8% UEL (dust): 65°C (Anhydrous form)

Molecular Weight Anhydrous: 192.13
Formula: C₆H₈O₇ or HOC(COOH)(CH₂COOH)₂
Monohydrate: 210.14
Formula: C₆H₈O₇.H₂O

Other Information SOLUBILITY: Very soluble in water (62% w/w).
Moderately soluble in Ether (2.7%); Ethyl Acetate (5.3%).
BULK DENSITY: Anhydrous 450-650 kg/m³ approx
Monohydrate 800-1000 kg/m³ approx.
Octanol Water Partition Co-efficient log Pow: -1.72 (anhydrous)
Stability and Reactivity
Stable under normal conditions in sealed, closed containers.
Releases hydrated water when heated or in dry air.

CONDITIONS TO AVOID: Dust cloud formation near ignition sources.
INCOMPATIBLE MATERIALS: Strong alkalis (bases), strong oxidizers, metal nitrates, reducing agents.
Corrodes copper, zinc, aluminium, antimony and their alloys.
HAZARDOUS DECOMPOSITION PRODUCTS: Irritating dust, Carbon Monoxide.
HAZARDOUS POLYMERISATION: Will not occur.

11. TOXICOLOGICAL INFORMATION

Toxicology Information
Acute Oral Toxicity LD50 (rat) : 3000-5000 mg/kg
Acute Oral Toxicity LD50 (rabbit): 7000 mg/kg

EYE IRRITATION: Causes eye irritation.
INHALATION IRRITATION: Causes respiratory irritation symptoms.

After swallowing large amounts it causes irritation of the stomach membranes, coughing, pin, bloody vomit.

BACTERIAL MUTAGENICITY (Ames Test): Negative [Merck SDS]
TERATOGENIC EFFECT: No effect in animal tests [Merck SDS]
REPRODUCTIVE EFFECTS: No impairment of reproductive performance in animal experiments [Merck SDS]

Inhalation
Irritating when inhaled. May be harmful if large amounts are inhaled.
Causes coughing.

Ingestion
Not harmful in small amounts.
May be harmful if large amounts are accidentally swallowed causing irritation of the stomach membranes, coughing, pin, and bloody vomit.

Skin
Causes skin irritation.

Eye
Severely irritating to the eyes.

Chronic Effects
Prolonged exposure in the diet can cause erosion of the teeth.
Prolonged contact causes skin irritation.
May cause allergic response in sensitive persons after prolonged and repeated contact.

12. ECOLOGICAL INFORMATION

Ecological Information
Generally non-water polluting substance when dilute. There may be a harmful aquatic effect from large spills, due to pH shift in the water body. Avoid contaminating waterways. Readily biodegradable.

Acute Aquatic Toxicity LC50 (Gold Fish, 96hrs) : 440-706 mg/L [IUCLID]
Acute Aquatic Toxicity EC50 (Daphnia Magna, 72hrs): 120 mg/L [IUCLID]
Acute Aquatic Toxicity EC5 (Bacteria, 16hrs) : >10000 mg/L [Merck SDS]
Acute Aquatic Toxicity IC5 (Algae, 7days) : 640 mg/L [Merck SDS]

Chemical Oxygen Demand (COD) : 728 mg O2/g (anhydrous) [Merck SDS]
Biological Oxygen Demand (BOD): 526 mg O2/g (anhydrous) [Merck SDS]

BIODEGRADABILITY: >98% after 2 days (OECD 302B)
BIOACCUMULATION : None

13. DISPOSAL CONSIDERATIONS

Disposal Considerations
DISPOSAL: In accordance with Local, State & Federal EPA waste regulations.
Advise its irritant and acid pH shifting nature.
May be reacted, composted, incinerated in an approved facility.
Trace amounts may be flushed to sewer with large amounts of water.

14. TRANSPORT INFORMATION
CITRIC ACID ANHYDROUS / MONOHYDRATE

15. REGULATORY INFORMATION

Transport Information
NOT defined as a Dangerous Good: by the Australian Code for the Transport of Dangerous Goods by Road & Rail; by the IATA Air Transport Dangerous Goods Regulations; or by the IMDG (International Maritime Dangerous Goods) Code.

Poisons Schedule
Not Scheduled

Packaging & Labelling
Workplace Hazardous Substance.
HAZARD CATEGORY: IRRITANT
R36/37/38 - Irritating to eyes, respiratory system and skin.

S22 Do not breathe dust.
S24/25 Avoid contact with skin and eyes.
S37/39 Wear suitable gloves and eye/face protection.
S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S28 After contact with skin, wash immediately with plenty of water.

AICS (Australia)
All ingredients are on the Australian Inventory of Chemical Substances. Also covered by Foods Standards Australia & New Zealand (FSANZ).

16. OTHER INFORMATION

Contact Person/Point
For EMERGENCIES ONLY Contact : 1800 033 111 (All Hours Australia)
0800 734 607 (All Hours New Zealand)

Amtrade International Pty Ltd: 61 3 9229 9229 (Melbourne)
61 2 9805 4200 (Sydney)

Amtrade New Zealand Limited : 64 9 579 6767 (Auckland)

NOTE: This MSDS summarises our best knowledge of the health and safety hazard information on the product, and how to safely handle and use the product in the workplace. Each user should read this MSDS and consider the information in the context of how the product will be handled and used in the workplace, including in conjunction with other products.

If clarification or further information is needed to ensure that an appropriate risk assessment can be made, the user should contact this company, or in the event of an emergency, the Emergency Response number above.

Our responsibility for products sold is subject to our standard terms and conditions, a copy is sent to our customers and is also available on request.

User Codes
User Field Title | User Code
--- | ---
Authorized by | J.Simpson
Prepared by | JS070918

Other Information
Key Changes: Converted to a 16 Part MSDS & General Review.

...End Of MSDS...