CITRIC ACID ANHYDROUS

1.0 SUBSTANCE IDENTIFICATION

1.1 Commercial product name: Citric Acid Anhydrous
1.2 Chemical characterisation: Organic acid – 2-hydroxy 1,2,3-propanetricarboxylic acid
1.3 Formula: $C_6H_8O_7$
1.4 Molecular weight: 192.13
1.5 CAS No: 77-92-9
1.6 EINECS No: 201-069-1
1.7 FOR USE IN FOOD (E330)
1.8 Manufactured by: Archer Daniels Midland Company, East Moore St. Extension Southport, North Carolina, U.S.A.
1.9 Supplied in Australia by: ADM Australia Pty Ltd, PO Box 281, Suite 1003, 1 Newland Street, Bondi Junction, NSW 2022
1.10 Australian Emergency Telephone Number: 1 800 608 755 (24 hours)

2.0 COMPOSITION

2.1 Typically 100% citric acid anhydrous.

3.0 HAZARDS IDENTIFICATION

3.1 Xi (St. Andrews Cross) IRRITANT (OECD 405) R36 Irritating to eyes

4.0 FIRST AID MEASURES

4.1 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

5.0 FIRE FIGHTING MEASURES

5.1 Needs external heat to burn.
5.2 All types of fire extinguisher are suitable.

6.0 ACCIDENTAL RELEASE MEASURES

6.1 After spillage/leakage: Recover by vacuum, or broom and shovel. Flush area with water or neutralizing solution as required.

7.0 HANDLING AND STORAGE

7.1 Store in well-closed containers in a cool, dry place. Maximum 30°C and 70% relative humidity.
7.2 Industrial hygiene – good ventilation required if process creates the formation of dust.

8.0 EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Personal precautions: Avoid contact with eyes and skin Avoid breathing dust
8.2 Respiratory protection: Approved nuisance dust mask
8.3 Eye protection: Goggles or safety glasses
8.4 Hand protection: Standard work gloves
8.5 Other: Skin protection required

9.0 PHYSICAL AND CHEMICAL PROPERTIES

9.1 Appearance: Crystals
9.2 Colour: Colourless
9.3 Odour: Odourless
9.4 Change in physical state: 153°C
9.5 Specific gravity: Bulk density (granular): 1.67 850 - 950 kg/m3 (typical range)
9.6 Vapour pressure: N/A – solid
9.7 Viscosity: N/A – solid
9.8 Solubility - in water (25°C): 61.8% w/w
- in ethanol (25°C): 38.3% w/w
9.9 pH (5% solution) (25°C): 1.8
9.10 Flash point: 345°C
9.11 Explosive properties (dust only): Class 1
9.12 Flammability: Requires external heat to burn
9.13 Thermal decomposition: Above 153°C may evolve carbon monoxide and carbon dioxide.

10.0 STABILITY AND REACTIVITY

10.1 Shelf life: Citric acid anhydrous is chemically stable if stored under cool, dry conditions; 30°C maximum and 70% relative humidity. Physical properties may change on storage; re -test recommended periodically and in the limit after three years.

10.2 Reactivity: Citric acid anhydrous will react with alkaline substances to generate heat. Aqueous solutions have corrosive effects on metals including carbon steels, 304 stainless steel, zinc, copper, aluminium and nickel alloys. This may result in the formation of hydrogen to produce explosive mixtures. These solutions also decompose cement-based products and attack some plastics such as nylon, polycarbonates, polyamides, polyimides or acrylics.

11.0 TOXICOLOGICAL INFORMATION

11.1	LD50 (rat):	Intravenous	885mg/kg	Oral	11,700 mg/kg*
11.2	LD50 (mouse):	Intravenous	961 mg/kg	Oral	5,040 mg/kg*

Ref: H.T.Yokotani et al, J.Takeda Res.Lab.30 (1) 25 (1971)
*FDA 223 - 275 - 2004 (1977)

12.0 ECOLOGICAL INFORMATION

12.1 COD 750 □ 50 mg O2/g

12.2 BOD5 625 □ 50 mg O2/g

12.3	DIN 38412 Part 5	Bacteriatoxicity	EC0 10,000 mg/l
12.4	DIN 38412 Part 15 (OECD 203)	Fishtoxicity	LD50 440 to 706 mg/l
12.5	DIN 38412 Part 25 (OECD 302B)	Biodegradability	98% within 2* to 24 hours

*Ref: P.Creach – C.R.Acad.Sci. Paris 240 2551 (1955)

13.0 DISPOSAL CONSIDERATIONS

13.1 Citric acid anhydrous is suitable for landfill. It may also be disposed after neutralisation with normal sewage **depending upon local regulations.**

14.0 TRANSPORT INFORMATION

14.1 No special considerations.

15.0 REGULATORY INFORMATION

15.1 Citric acid anhydrous is an EU permitted Food Additive (E 330). Conditions of use *quantum satis*. The US Food and Drug Administration classifies citric acid as a GRAS (Generally Recognised As Safe) food ingredient.

15.2 According to the Joint Expert Committee on Food Additives of the WHO/FAO, citric acid anhydrous may be used without limitation according to Good Manufacturing Practice.

15.3 Classification and Labelling of Dangerous Substances according to Directive 67/548/EEC and Amendments – Xi-Irritant: R36 Irritating to eyes: S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. References: ECAMA Internal Report 1998
Citric acid has irritancy equivalent to Fumaric Acid. See Annex 1 to Directive 67/548/EEC.

15.4 Water Hazard Class (Germany) – 0

15.5 Directive 67/548/EEC "Annex 7" – Non-toxic to the Environment.

16.0 ADDITIONAL INFORMATION

16.1 See Product Data Sheet.

16.2 This Safety Data Sheet has been prepared in conjunction with CEFIC (European Chemical Industry Council) in Brussels.