Safety Data Sheet

MERCK

According to EC Directive 91/155/EEC

Date of issue: 04.07.2001 Supersedes edition of 19.10.1999

1. Identification of the substance/preparation and of the company/undertaking

Identification of the product

Catalogue No.: 100242

Product name: Citric acid monohydrate cryst. extra pure Ph Eur,BP,USP,E 330

Manufacturer/supplier identification

Company: Merck KGaA * 64271 Darmstadt * Germany * Tel: +49 6151 72-0

Emergency telephone No.: Please contact the regional Merck representation in your country.

2. Composition/information on ingredients

Synonyms

Hydroxytricarballylic acid

CAS-No.: 5949-29-1

M: 210.14 g/mol EC-No.: 201-069-1

Formula Hill: $C_6H_8O_7 * H_2O$

3. Hazards identification

Irritating to eyes.

4. First aid measures

After inhalation: fresh air.
After skin contact: wash off with plenty of water. Remove contaminated clothing.
After eye contact: rinse out with plenty of water with the eyelid held wide open. Summon eye specialist.
After swallowing: make victim drink plenty of water, induce vomiting, summon doctor.

5. Fire-fighting measures

Suitable extinguishing media:
powder, foam, spray water.

Special risks:
Combustible. Development of hazardous combustion gases or vapours possible in the event of fire.

Special protective equipment for fire fighting:
Do not stay in dangerous zone without suitable chemical protection clothing and self-contained breathing apparatus.

Other information:
Contain escaping vapours with water. Prevent fire-fighting water from entering surface water or groundwater.

6. Accidental release measures

Person-related precautionary measures:
Avoid substance contact. Avoid generation of dusts; do not inhale dusts.

Environmental-protection measures:
Do not allow to enter sewerage system.

Procedures for cleaning / absorption:
Take up dry. Forward for disposal. Clean up affected area.

7. Handling and storage

Handling:

Store protected from solvents.
No further requirements.

Storage:

Tightly closed. Dry. Storage temperature: no restrictions.

Requirements for storage rooms and containers:
No metal containers.

8. Exposure controls/personal protection

Specific control parameter

German regulations

MAK Germany (max. workplace conc.)

Name	Citric acid
Value	see MAK-List - Substances for which, as yet, no MAK Value can be Established

Personal protective equipment:

Protective clothing should be selected specifically for the working place, depending on concentration and quantity of the hazardous substances handled. The resistance of the protective clothing to chemicals should be ascertained with the respective supplier.

Respiratory protection:	required when dusts are generated.
Eye protection:	required
Hand protection:	required

Industrial hygiene:
Change contaminated clothing. Application of skin- protective barrier cream recommended. Wash hands after working with substance.

9. Physical and chemical properties

Form:	solid	
Colour:	white	
Odour:	odourless	
pH value		
at 50 g/l H_2O	(25 °C)	1.85
Melting point		135-152 °C

Boiling point			(decomposition)		
Ignition temperature			345	°C	(anhydrous substance)
Flash point			not applicable		
Explosion limits	lower		not available		
	upper		not available		
Vapour pressure		(20 °C)	< 0.1	hPa	(anhydrous substance)
Density		(20 °C)	1.54	g/cm^3	
Bulk density			~ 800-1000	kg/m^3	
Solubility in					
water		(20 °C)	~ 1630	g/l	
ethanol		(25 °C)	419	g/l	
ether			sparingly soluble		
Thermal decomposition			> 170	°C	
log P(oct):		(20 °C)	-1.72		(anhydrous substance)

10. Stability and reactivity

Conditions to be avoided

Strong heating.

Substances to be avoided

metals, oxidizing agent, bases, reducing agents.

Hazardous decomposition products

not known to date

Further information

releases water of crystallization when heated.

11. Toxicological information

Acute toxicity

LD_{50} (oral, rat): 3000 mg/kg (anhydrous substance).

Subacute to chronic toxicity

No impairment of reproductive performance in animal experiments.
No teratogenic effect in animal experiments.

Bacterial mutagenicity: Ames-Test: negative.

Further toxicological information

Substance which occurs in the human body under physiological conditions.
After inhalation of dust: Irritation symptoms in the respiratory tract.
After skin contact: Slight irritations.
After eye contact: Irritations.
After swallowing of large amounts: Irritations of: mucous membranes (stomach); coughing, pain, bloody vomiting.

Further data

Further hazardous properties cannot be excluded. The product should be handled with the care usual when dealing with chemicals.

12. Ecological information

Biologic degradation:
Biodegradation: >98 % /2 d Zahn-Wellens test;
Easily eliminable.

Behavior in environmental compartments:
Distribution: log p(o/w): -1.72 (20 °C) (anhydrous substance);
No bioaccumulation is to be expected (log P(o/w <1).

Ecotoxic effects:
Biological effects: Harmful effect due to pH shift.
Fish toxicity: L.idus LC_{50}: 440-760 mg/l /96 h (anhydrous substance);
Daphnia toxicity: Daphnia magna EC_{50}: ~120 mg/l /72 h (anhydrous substance).
Maximum permissible toxic concentration:
Protozoa: E.sulcatum EC_5: 485 mg/l /72 h (anhydrous substance);
Bacterial toxicity: Ps.putida EC_5: >10000 mg/l /16 h (anhydrous substance); M.aeruginosa EC_5: 80 mg/l /8 d (anhydrous substance);
Algeal toxicity: Sc.quadricauda IC_5: 640 mg/l /7 d (anhydrous substance);

Further ecologic data:
Degradability:
BOD: 0.481 g/g (for the monohydrate);
TOD: 0.686 g/g (for the monohydrate);
COD: 0.685 g/g (for the monohydrate).

No ecological problems are to be expected when the product is handled and used with due care and attention.

13. Disposal considerations

Product:

There are no uniform EC Regulations for the disposal of chemicals or residues. Chemical residues generally count as special waste. The disposal of the latter is regulated in the EC member countries through corresponding laws and regulations. We recommend that you contact either the authorities in charge or approved waste disposal companies which will advise you on how to dispose of special waste.

Packaging:

Disposal in compliance with official regulations. Handle contaminated packaging in the same way as the substance itself. If not officially specified differently, non-contaminated packaging may be treated like household waste or recycled.

14. Transport information

Entire package: not subject to transport regulations.

15. Regulatory information

Labelling according to EC Directives

Symbol:	Xi	Irritant
R-phrases:	36	Irritating to eyes.
S-phrases:	26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

16. Other information

Change in labelling.

General update.

Regional representation:

This information is given on the authorised Safety Data Sheet for your country.

The information contained herein is based on the present state of our knowledge. It characterizes the product with regard to the appropriate safety precautions. It does not represent a guarantee of the properties of the product.

Safety data sheet

MERCK

According to EC Directive 91/155/EEC

Date of issue: 19.09.2000

1. Identification of the substance/preparation and of the company/undertaking

Identification of the product

Catalogue No.: 101905

Product name: Silica gel granules, desiccant ~ 0,2 - 1 mm

Manufacturer/supplier identification

Company: Merck KGaA * 64271 Darmstadt * Germany * Tel: +49 6151 72-0

Emergency telephone No.: Please contact the regional Merck representation in your country.

2. Composition/information on ingredients

silicon dioxide amorphous.

CAS-No.: 7631-86-9

M: 60.09 g/mol EC-No.: 231-545-4

Formula Hill: O_2Si

3. Hazards identification

No hazardous product as specified in Directive 67/548/EEC.

4. First aid measures

After inhalation: fresh air.
After skin contact: wash off with water.
After eye contact: rinse out with water.
After swallowing (large amounts): consult doctor if feeling unwell.

5. Fire-fighting measures

Suitable extinguishing media:
In adaption to materials stored in the immediate neighbourhood.

Special risks:
Non-combustible.

6. Accidental release measures

Person-related precautionary measures:
Avoid inhalation of dusts.

Procedures for cleaning / absorption:
Take up dry. Forward for disposal. Clean up affected area. Avoid generation of dusts.

7. Handling and storage

Handling:

Protect from moisture.

Storage:

Tightly closed. Dry. Storage temperature: no restrictions.

8. Exposure controls/personal protection

Specific control parameter

German regulations

MAK Germany (max. workplace conc.)

Name	Silica, amorphous	
Value	4 mg/m^3	inhalable dust
Embryotoxic	cat. C no risk expected by maintaining TLV	

Personal protective equipment:

Protective clothing should be selected specifically for the working place, depending on concentration and quantity of the hazardous substances handled. The resistance of the protective clothing to chemicals should be ascertained with the respective supplier.

Respiratory protection:	required when dusts are generated.
Eye protection:	required
Hand protection:	Use recommended

Industrial hygiene:
Wash hands after working with substance.

Change contaminated clothing. Wash hands after working with substance.

9. Physical and chemical properties

Form:		solid	
Colour:		brownish	
Odour:		odourless	
pH value			not available
Melting point			not available
Boiling point			not available
Ignition temperature			not available
Flash point			not available
Explosion limits	lower		not available
	upper		not available
Density			not available
Bulk density			~ 750-800 kg/m^3
Solubility in water		(20 °C)	insoluble
Particle size			~ 2-5 mm

10. Stability and reactivity

Conditions to be avoided

no information available

Substances to be avoided

halogen oxides, hydrogen halides, light metals / heat, xenon hexafluoride, sodium / heat.

Hazardous decomposition products

no information available

11. Toxicological information

Acute toxicity

Quantitative data on the toxicity of this product are not available.

Subacute to chronic toxicity

An embryotoxic effect need not be feared when the threshold limit value is observed.

Further toxicological information

This is a generally physiologically inert substance that displays no hazardous properties after oral intake and skin contact and after inhalation of its dusts as long as the total dust limit for silicic acid is adhered to. Intensive contact with the eye may lead to irritation symptoms.

Further data

The product should be handled with the care usual when dealing with chemicals.

12. Ecological information

Ecotoxic effects:
Quantitative data on the ecological effect of this product are not available.

Further ecologic data:
No ecological problems are to be expected when the product is handled and used with due care and attention.

13. Disposal considerations

Product:

There are no uniform EC Regulations for the disposal of chemicals or residues. Chemical residues generally count as special waste. The disposal of the latter is regulated in the EC member countries through corresponding laws and regulations. We recommend that you contact either the authorities in charge or approved waste disposal companies which will advise you on how to dispose of special waste.

Packaging:

Disposal in compliance with official regulations. Handle contaminated packaging in the same way as the substance itself. If not officially specified differently, non-contaminated packaging may be treated like household waste or recycled.

14. Transport information

Not subject to transport regulations.

15. Regulatory information

Labelling according to EC Directives

Symbol: ---

R-phrases: ---

S-phrases: ---

16. Other information

Regional representation:

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Safety Data Sheet

MERCK

According to EC Directive 91/155/EEC

Date of issue: 03.03.2002 Supersedes edition of 30.10.2001

1. Identification of the substance/preparation and of the company/undertaking

Identification of the product

Catalogue No.: 100983

Product name: Ethanol absolute GR for analysis ACS,ISO

Company/undertaking identification

Company: Merck KGaA * 64271 Darmstadt * Germany * Tel: +49 6151 72-0

Emergency telephone No.: Please contact the regional Merck representation in your country.

2. Composition/information on ingredients

Synonyms

Ethyl alcohol, Spirit, Spirit of wine

CAS-No.:	64-17-5	EC-Index-No.:	603-002-00-5
M:	46.07 g/mol	EC-No.:	200-578-6
Formula Hill:	C_2H_6O		
Chemical formula:	C_2H_5OH		

3. Hazards identification

Highly flammable.

4. First aid measures

After inhalation: fresh air.
After skin contact: wash off with plenty of water. Remove contaminated clothing.
After eye contact: rinse out with plenty of water with the eyelid held wide open. Call in ophtalmologist if necessary.
After swallowing: immediately make victim drink plenty of water. Consult doctor if feeling unwell.

5. Fire-fighting measures

Suitable extinguishing media:
CO_2, foam, powder.

Special risks:
Combustible. Vapours heavier than air. Forms explosive mixtures with air at ambient temperatures. Development of hazardous combustion gases or vapours possible in the event of fire.

Special protective equipment for fire fighting:
Do not stay in dangerous zone without self-contained breathing apparatus.

Other information:
Cool container with spray water from a save distance. Contain escaping vapours with water. Prevent fire-fighting water from entering surface water or groundwater. Keep away sources of ignition.

6. Accidental release measures

Person-related precautionary measures:
Do not inhale vapours/aerosols. Ensure supply of fresh air in enclosed rooms.

Environmental-protection measures:
Do not allow to enter sewerage system; risk of explosion!

Procedures for cleaning / absorption:
Take up with liquid-absorbent material (e.g. Chemizorb®). Forward for disposal. Clean up affected area.

7. Handling and storage

Handling:

Notes for prevention of fire and explosion:
Keep away from sources of ignition. Take measures to prevent electrostatic charging.

Storage:

Tightly closed. In a well-ventilated place. At +15°C to +25°C.

8. Exposure controls/personal protection

Personal protective equipment:

Protective clothing should be selected specifically for the working place, depending on concentration and quantity of the hazardous substances handled. The resistance of the protective clothing to chemicals should be ascertained with the respective supplier.

Respiratory protection:	required when vapours/aerosols are generated. Filter A (acc. to DIN 3181) for vapours of organic compounds
Eye protection:	required
Hand protection:	required

Industrial hygiene:
Change contaminated clothing. Application of skin- protective barrier cream recommended. Wash hands after working with substance.

9. Physical and chemical properties

Form:		liquid			
Colour:		colourless			
Odour:		alcohol-like			
pH value					
at 10 g/l H_2O		(20 °C)	7.0		
Viscosity dynamic		(20 °C)	1.2	mPa*s	
Melting point			-114.5	°C	
Boiling point			78.3	°C	
Ignition temperature			425	°C	
Flash point			12	°C	c.c.
Explosion limits	lower		3.5	Vol%	
	upper		15	Vol%	
Vapour pressure		(20 °C)	59	hPa	

Relative vapour density		1.6
Density	(20 °C)	0.790-0.793g/cm^3
Solubility in		
water	(20 °C)	soluble
organic solvents		soluble
log Pow:		-0.32
Bioconcentration factor		0.66

10. Stability and reactivity

Conditions to be avoided

Heating.

Substances to be avoided

alkali metals, alkaline earth metals, alkali oxides, strong oxidizing agents, halogen-halogen compounds, CrO_3, chromyl chloride, ethylene oxide, fluorine, perchlorates, potassium permanganate / sulfuric acid, perchloric acid, permanganic acid, phosphorus oxides, nitric acid, nitrogen dioxide, uranium hexafluoride, hydrogen peroxide.

Hazardous decomposition products

no information available

Further information

highly inflammable;
unsuitable working materials: various plastics, rubber;
Explosible with air in a vaporous/gaseous state.

11. Toxicological information

Acute toxicity

LC_{50} (inhalation, rat): >8000 mg/l /4 h.
LD_{50} (dermal, rabbit): >20000 mg/kg.
LD_{50} (oral, rat): 6200 mg/kg.

Specific symptoms in animal studies:
Eye irritation test (rabbit): Slight irritations.
Skin irritation test (rabbit): Slight irritations.

Subacute to chronic toxicity

Sensitization:
Sensitisation test (Magnusson and Kligman): negative.

An embryotoxic effect need not be feared when the threshold limit value is observed.

Bacterial mutagenicity: Salmonella typhimurium: negative.
Bacterial mutagenicity: Ames test: negative.

Further toxicological information

After inhalation of vapours: slight mucosal irritations. Risk of absorption.
After skin contact: After long-term exposure to the chemical: dermatitis.
After eye contact: Slight irritations.
After swallowing of large amounts: nausea and vomiting.
Systemic effects: euphoria.
After absorption of large quantities: dizziness, inebriation, narcosis, respiratory paralysis.

Further data

The product should be handled with the care usual when dealing with chemicals.

12. Ecological information

Abiotic degradation:
Rapid degradation. (air)

Biologic degradation:
Biodegradation: 94 % modified OECD screening test;
Readily biodegradable.

Behavior in environmental compartments:
Distribution: log p(o/w): -0.32;
No bioaccumulation is to be expected (log P(o/w <1).

Ecotoxic effects:
Biological effects:
In high concentrations: Harmfull effect on aquatic organisms. When used properly, no impairments in the function of waste- water-treatment plants are to be expected.
Fish toxicity: L.idus LC_{50}: 8140 mg/l /48 h;
Daphnia toxicity: Daphnia magna EC_{50}: 9268-14221 mg/l /48 h;
Maximum permissible toxic concentration:
Algeal toxicity: Sc.quadricauda IC_5: 5000 mg/l /7 d; Bacterial toxicity: Ps.putida EC_5: 6500 mg/l /16 h; Protozoa: E.sulcatum EC_5: 65 mg/l /72 h.

Further ecologic data:
BOD_5: 0.93-1.67 g/g; COD: 1.99 g/g; TOD: 2.10 g/g; BOD 74 % from TOD /5 d; COD 90 % from TOD;

No ecological problems are to be expected when the product is handled and used with due care and attention.

13. Disposal considerations

Product:

There are no uniform EC Regulations for the disposal of chemicals or residues. Chemical residues generally count as special waste. The disposal of the latter is regulated in the EC member countries through corresponding laws and regulations. We recommend that you contact either the authorities in charge or approved waste disposal companies which will advise you on how to dispose of special waste.

Packaging:

Disposal in compliance with official regulations. Handle contaminated packaging in the same way as the substance itself. If not officially specified differently, non-contaminated packaging may be treated like household waste or recycled.

14. Transport information

Land transport	GGVS, GGVE, ADR, RID
Classification	3/3b
Name	1170 ETHANOL (ETHYLALKOHOL)
Transport by river	ADN, ADNR
Classification	not tested
Transport by sea	IMDG, GGVSee
Classification	3/UN 1170/PG II
Ems	3-06
Name	ETHANOL
Transport by air	ICAO, IATA
Classification	3/UN 1170/PG II
Name	ETHANOL

The transport regulations are cited according to international regulations and in the form applicable in Germany (GGVS/GGVE). Possible national deviations in other countries are not considered.
THESE TRANSPORT DATA APPLY TO THE ENTIRE PACK !

15. Regulatory information

Labelling according to EC Directives

Symbol:	F	Highly flammable
R-phrases:	11	Highly flammable.
S-phrases:	7-16	Keep container tightly closed. Keep away from sources of ignition - No smoking.
EC-No.:	200-578-6	EC label

16. Other information

Reduced labelling on the container due to small quantity.

Chapter 8: specific control parameter.
Chapter 14: transport information.

General update.

Regional representation:

This information is given on the authorised Safety Data Sheet for your country.

The information contained herein is based on the present state of our knowledge. It characterizes the product with regard to the appropriate safety precautions. It does not represent a guarantee of the properties of the product.

Safety data sheet

MERCK

According to EC Directive 91/155/EEC

Date of issue: 10.02.2000 Supersedes edition of 23.06.1989

1. Identification of the substance/preparation and of the company/undertaking

Identification of the product

Catalogue No.: 106161

Product name: Murexide (ammonium purpurate) metal indicator ACS

Manufacturer/supplier identification

Company: Merck KGaA * 64271 Darmstadt * Germany * Tel: +49 6151 72-2440

Emergency telephone No.: Please contact the regional Merck representation in your country.

2. Composition/information on ingredients

Synonyms

Ammonium purpurate, acid

CAS-No.: 3051-09-0

M: 284.19 g/mol EC-No.: 221-266-6

Molecular formula: $C_8H_8N_6O_6$
(Hill)

3. Hazards identification

No hazardous product as specified in Directive 67/548/EEC.

4. First aid measures

After inhalation: fresh air.
After skin contact: wash off with plenty of water. Remove contaminated clothing.
After eye contact: rinse out with plenty of water with the eyelid held wide open.
After swallowing: make victim drink plenty of water, induce vomiting, summon doctor.

5. Fire-fighting measures

Suitable extinguishing media:
Water, foam, powder.

Special risks:
Combustible.

Other information:
Prevent fire-fighting water from entering surface water or groundwater.

6. Accidental release measures

Person-related precautionary measures:
Avoid generation of dusts; do not inhale dusts.

Environmental-protection measures:
Do not allow to enter sewerage system.

Procedures for cleaning / absorption:
Take up dry. Forward for disposal. Clean up affected area.

7. Handling and storage

Handling:

No further requirements.

Storage:

Dry. Tightly closed. No further requirements. Storage temperature: no restrictions.

Tightly closed.

8. Exposure controls/personal protection

Personal protective equipment:

Protective clothing should be selected specifically for the working place, depending on concentration and quantity of the hazardous substances handled. The resistance of the protective clothing to chemicals should be ascertained with the respective supplier.

Respiratory protection: required when dusts are generated.

Eye protection: required

Hand protection: required

Industrial hygiene:
Change contaminated clothing. Wash hands after working with substance.

9. Physical and chemical properties

Form:		solid			
Colour:		dark brown			
Odour:		odourless			
pH value					
at 1 g/l H_2O		(20 °C)	~ 5		
Melting point			not available		
Boiling point			not available		
Ignition temperature			not available		
Flash point			not available		
Explosion limits	lower		not available		
	upper		not available		
Density			not available		
Bulk density			~ 330	kg/m^3	
Solubility in					
water		(20 °C)	~ 1	g/l	
ethanol		(20 °C)			insoluble
Thermal decomposition			> 250	°C	

10. Stability and reactivity

Conditions to be avoided

no information available

Substances to be avoided

no information available

Hazardous decomposition products

no information available

11. Toxicological information

Acute toxicity

Quantitative data on the toxicity of this product are not available.

Further toxicological information

We have no description of any toxic symptoms.
Hazardous properties cannot be excluded but are unlikely when the product is handled appropriately.

Further data

The product should be handled with the care usual when dealing with chemicals.

12. Ecological information

Ecotoxic effects:
Quantitative data on the ecological effect of this product are not available.

Further ecologic data:
No ecological problems are to be expected when the product is handled and used with due care and attention.

13. Disposal considerations

Product:

There are no uniform EC Regulations for the disposal of chemicals or residues. Chemical residues generally count as special waste. The disposal of the latter is regulated in the EC member countries through corresponding laws and regulations. We recommend that you contact either the authorities in charge or approved waste disposal companies which will advise you on how to dispose of special waste.

Packaging:

Disposal in compliance with official regulations. Handle contaminated packaging in the same way as the substance itself. If not officially specified differently, non-contaminated packaging may be treated like household waste or recycled.

14. Transport information

Not subject to transport regulations.

15. Regulatory information

Labelling according to EC Directives

Symbol: ---

R-phrases: ---

S-phrases: ---

16. Other information

Reason for alteration

General update.

Change in product name.

Regional representation:

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