



Citroflex™ A-4

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations
Issue date: 12/30/1999 Revision Date: 4/29/2024 Supersedes: 2/19/2022 Version: 5.0

SECTION 1: Identification

1.1. Identification

Product form	: Substance
Trade name	: Citroflex™ A-4
CAS-No.	: 77-90-7
Formula	: C20H34O8
Synonyms	: ATBC; Acetyltri-n-butylcitrate; Tributyl O-acetylcitrate; ATC IV; 1,2,3-Propanetricarboxylic acid, 2-(acetyloxy)-, tributyl ester

1.2. Recommended use and restrictions on use

Use of the substance/mixture	: Plasticizer Perfumes, Fragrances
Restrictions on use	: None

1.3. Supplier

Aurorium
201 North Illinois Street
Suite 1800
Indianapolis, IN, 46204
USA
T +1-317-247-8141
SDS@aurorium.com - www.aurorium.com

1.4. Emergency telephone number

Emergency number	: Aurorium: +1-317-247-8141 CHEMTREC (USA): +1-800-424-9300 CHEMTREC (International): +1-703-527-3887
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SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

GHS US classification

Not classified

2.2. GHS Label elements, including precautionary statements

GHS US labeling

No labeling applicable

2.3. Other hazards which do not result in classification

No additional information available

2.4. Unknown acute toxicity (GHS US)

Not applicable

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SECTION 3: Composition/Information on ingredients

3.1. Substances

Substance type : Mono-constituent
Name : Citroflex™ A-4
CAS-No. : 77-90-7

Name	Product identifier	%	GHS US classification
Acetyl tributyl citrate	CAS-No.: 77-90-7	≈ 100	Not classified

Full text of hazard classes and H-statements : see section 16

3.2. Mixtures

Not applicable

SECTION 4: First-aid measures

4.1. Description of first aid measures

First-aid measures general : Wear gloves.
First-aid measures after inhalation : Remove person to fresh air and keep comfortable for breathing. If experiencing respiratory symptoms: Call a poison center or a doctor.
First-aid measures after skin contact : Rinse skin with water/shower. If skin irritation occurs: Get medical advice/attention.
First-aid measures after eye contact : Immediately rinse with water for a prolonged period while holding the eyelids wide open. If eye irritation persists: Get medical advice/attention.
First-aid measures after ingestion : Rinse mouth out with water. Do NOT induce vomiting. Get medical advice/attention.

4.2. Most important symptoms and effects (acute and delayed)

Symptoms/effects after inhalation : None under normal use.
Symptoms/effects after skin contact : None under normal use.
Symptoms/effects after eye contact : May cause slight temporary irritation.
Symptoms/effects after ingestion : None under normal use. May cause gastrointestinal irritation, nausea, vomiting and diarrhea.
Chronic symptoms : No chronic health hazards are likely for this material.

4.3. Immediate medical attention and special treatment, if necessary

Not required for normal conditions of use. Treat symptomatically.

SECTION 5: Fire-fighting measures

5.1. Suitable (and unsuitable) extinguishing media

Suitable extinguishing media : Water spray. Foam. Carbon dioxide (CO2). Dry chemical.
Unsuitable extinguishing media : Do not use a water jet since it may cause the fire to spread.

5.2. Specific hazards arising from the chemical

Fire hazard : Not classified. Could burn but does not ignite readily.
Explosion hazard : Product is not explosive.
Hazardous decomposition products in case of fire : Carbon dioxide. Carbon monoxide.

5.3. Special protective equipment and precautions for fire-fighters

Firefighting instructions : Fight fire with normal precautions from a reasonable distance.
Protection during firefighting : Wear recommended personal protective equipment. Complete protective clothing. Self-contained breathing apparatus.

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SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Ventilate spillage area. Mark out the contaminated area with signs and prevent access to unauthorized personnel.

6.1.1. For non-emergency personnel

Emergency procedures : Evacuate unnecessary personnel. Avoid breathing spray, vapors, mist. Avoid contact with skin, eyes and clothing.

6.1.2. For emergency responders

Emergency procedures : Do not attempt to take action without suitable protective equipment.

6.2. Environmental precautions

Do not allow product to spread into the environment. Prevent entry to sewers and public waters.

6.3. Methods and material for containment and cleaning up

For containment : Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.

Methods for cleaning up : Absorb spilled material with sand or earth. Shovel into suitable and closed container for disposal. Wash contaminated area with large amounts of water. Ventilate spillage area.

Other information : Collect all waste in suitable and labeled containers and dispose according to local legislation.

6.4. Reference to other sections

For further information refer to section 8: "Exposure controls/personal protection". For waste disposal after cleaning, see section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Ensure adequate ventilation. Use personal protective equipment as required. Handle in accordance with good industrial hygiene and safety procedures.

Hygiene measures : Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store in a well-ventilated place. Keep cool. Keep away from open flames, hot surfaces and sources of ignition.

Incompatible products : Strong acids. Strong bases. Strong oxidizers.

Incompatible materials : None known.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Citroflex™ A-4 (77-90-7)

No additional information available

Acetyl tributyl citrate (77-90-7)

No additional information available

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8.2. Appropriate engineering controls

- Appropriate engineering controls : Provide local exhaust or general room ventilation. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.
- Environmental exposure controls : Avoid release to the environment.

8.3. Individual protection measures/Personal protective equipment

Hand protection:
Chemically resistant protective gloves. Protective gloves made of PVC. Nitrile rubber gloves
Eye protection:
Chemical goggles or safety glasses
Skin and body protection:
Wear suitable protective clothing. Chemical resistant safety shoes
Respiratory protection:
In case of inadequate ventilation wear respiratory protection.

Thermal hazard protection:

Insulating protective gloves.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Liquid
Appearance	: Clear oily liquid.
Color	: Colorless
Odor	: Very slight
Odor threshold	: No data available
pH	: No data available
Melting point	: -80 °C (Pour point: -57°C)
Freezing point	: < -50 °C
Boiling point	: 326 °C (101.324 Pa)
Flash point	: 204 °C
Relative evaporation rate (butyl acetate=1)	: < 1
Flammability (solid, gas)	: Not applicable
Vapor pressure	: < 0.133 kPa
Relative vapor density at 20°C	: 14.1
Relative density	: 1.046 (Literature data)
Density	: 1.048 g/ml (25°C)
Molecular mass	: 402.47 g/mol
Solubility	: Water: 4.49 mg/l (20°C)
Partition coefficient n-octanol/water (Log Pow)	: 4.92 (22 °C) 4.92
Auto-ignition temperature	: 278 °C (ASTM D659)
Decomposition temperature	: No data available
Viscosity, kinematic	: 40.744 mm²/s
Viscosity, dynamic	: 42.7 mPa·s (25°C)
Explosion limits	: Not applicable Lower explosion limit: Not applicable Upper explosion limit: Not applicable
Explosive properties	: Product is not explosive.
Oxidizing properties	: No.

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9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

No dangerous reactions known.

10.2. Chemical stability

The product is stable at normal handling and storage conditions.

10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use.

10.4. Conditions to avoid

Overheating. Open flame.

10.5. Incompatible materials

Strong acids. Strong bases. Strong oxidizers.

10.6. Hazardous decomposition products

Carbon dioxide. Carbon monoxide.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity (oral)	: Based on available data, the classification criteria are not met
Acute toxicity (dermal)	: Based on available data, the classification criteria are not met (Neither mortality nor clinical signs of toxicity were observed with the given dose)
Acute toxicity (inhalation)	: Based on available data, the classification criteria are not met

Citroflex™ A-4 (77-90-7)	
LD50 oral rat	> 31500 mg/kg body weight (Literature Reference)
LD50 dermal rabbit	> 1000 mg/kg body weight (Literature Reference)

Skin corrosion/irritation	: Not irritating to skin
Serious eye damage/irritation	: Slightly irritant but not relevant for classification
Respiratory or skin sensitization	: Based on available data, the classification criteria are not met
Germ cell mutagenicity	: Based on available data, the classification criteria are not met
Carcinogenicity	: Based on available data, the classification criteria are not met
Reproductive toxicity	: Based on available data, the classification criteria are not met

Citroflex™ A-4 (77-90-7)	
Additional data	NOAEL, subchronic, oral, rat: 1000 mg/kg bw/day (13 weeks, (OECD 408 method))

STOT-single exposure	: Based on available data, the classification criteria are not met
STOT-repeated exposure	: Based on available data, the classification criteria are not met

Citroflex™ A-4 (77-90-7)	
NOAEL (subchronic,oral,animal/male,90 days)	≥ 300 mg/kg body weight

Aspiration hazard	: Not classified
Viscosity, kinematic	: 40.744 mm²/s

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Symptoms/effects after inhalation	: None under normal use.
Symptoms/effects after skin contact	: None under normal use.
Symptoms/effects after eye contact	: May cause slight temporary irritation.
Symptoms/effects after ingestion	: None under normal use. May cause gastrointestinal irritation, nausea, vomiting and diarrhea.
Chronic symptoms	: No chronic health hazards are likely for this material.

SECTION 12: Ecological information

12.1. Toxicity

Citroflex™ A-4 (77-90-7)	
LC50 - Fish [1]	38 – 60 mg/l (OECD 203 method or equivalent)
EC50 - Crustacea [1]	7.82 mg/l (EPA OPPTS 850.1010)
LC50 - Other aquatic organisms [2]	74.4 mg/l algae (OECD 201 method)
NOEC chronic crustacea	≈ 1.1 mg/l

12.2. Persistence and degradability

Citroflex™ A-4 (77-90-7)	
Persistence and degradability	Rapidly degradable.

12.3. Bioaccumulative potential

Citroflex™ A-4 (77-90-7)	
BCF - Other aquatic organisms [1]	31.57 (BCFBAF v3.00, Calculated value)
Partition coefficient n-octanol/water (Log Pow)	4.92 (22 °C)
Partition coefficient n-octanol/water (Log Kow)	4.92
Bioaccumulative potential	Low bioaccumulation potential.

12.4. Mobility in soil

Citroflex™ A-4 (77-90-7)	
Mobility in soil	Product adsorbs onto the soil
Surface tension	54.6 mN/m (OECD 115 method)
Organic Carbon Normalized Adsorption Coefficient (Log Koc)	4.271 (OECD 121 method)

12.5. Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1. Disposal methods

Waste treatment methods	: Dispose in a safe manner in accordance with local/national regulations.
Sewage disposal recommendations	: Do not dispose of waste into sewer.
Product/Packaging disposal recommendations	: Dispose of contents or container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.

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SECTION 14: Transport information

In accordance with DOT / IMDG / IATA

DOT	IMDG	IATA
14.1. UN number		
Not regulated for transport		
14.2. Proper Shipping Name		
Not applicable	Not applicable	Not applicable
14.3. Transport hazard class(es)		
Not applicable	Not applicable	Not applicable
14.4. Packing group		
Not applicable	Not applicable	Not applicable
14.5. Environmental hazards		
Not applicable	Not applicable	Not applicable
No supplementary information available		

14.6. Special precautions for user

DOT

No data available

IMDG

No data available

IATA

No data available

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable

SECTION 15: Regulatory information

15.1. US Federal regulations

Commercial status of components according to the United States Environmental Protection Agency's Toxic Substances Control Act (TSCA):

Name	CAS-No.	Listing	Commercial status	Flags
Acetyl tributyl citrate	77-90-7	Present	Active	

This product or mixture is NOT known to contain a toxic chemical or chemicals in excess of the applicable de minimis concentration as specified in 40 CFR §372.38(a) subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

15.2. International regulations

CANADA

Citroflex™ A-4 (77-90-7)

Listed on the Canadian DSL (Domestic Substances List)

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EU-Regulations

Citroflex™ A-4 (77-90-7)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

National regulations

Citroflex™ A-4 (77-90-7)

Listed introduction on Australian Industrial Chemicals Introduction Scheme (AICIS Inventory)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on the Japanese ENCS (Existing New Chemical Substances) inventory
Listed on KECL/KECI (Korean Existing Chemicals Inventory)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on the Japanese ISHL (Industrial Safety and Health Law)
Listed on INSQ (Mexican National Inventory of Chemical Substances)
Listed on the TCSI (Taiwan Chemical Substance Inventory)
Listed on the NCI (Vietnam - National Chemical Inventory)

15.3. US State regulations

No additional information available

SECTION 16: Other information

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Data sources : Aurorium. REACH data.

Other information : ™ Indicates a proprietary trademark, registered in the US and/or elsewhere.

Abbreviations and acronyms

CAS-No.	Chemical Abstract Service number
ADN	European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
ATE	Acute Toxicity Estimate
BCF	Bioconcentration factor
CLP	Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008
BOD	Biochemical oxygen demand (BOD)
COD	Chemical oxygen demand (COD)
DNEL	Derived-No Effect Level
EC-No.	European Community number
EC50	Median effective concentration
ED	Endocrine disrupting properties
EN	European Standard
IATA	International Air Transport Association
IMDG	International Maritime Dangerous Goods

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Abbreviations and acronyms	
LC50	Median lethal concentration
LD50	Median lethal dose
LOAEL	Lowest Observed Adverse Effect Level
NOAEL	No-Observed Adverse Effect Level
OECD	Organisation for Economic Co-operation and Development
PBT	Persistent Bioaccumulative Toxic
PNEC	Predicted No-Effect Concentration
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006
WGK	Water Hazard Class
vPvB	Very Persistent and Very Bioaccumulative

NFPA health hazard

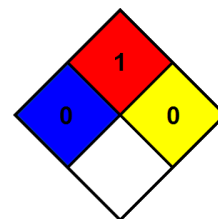
: 0 - Materials that, under emergency conditions, would offer no hazard beyond that of ordinary combustible materials.

NFPA fire hazard

: 1 - Materials that must be preheated before ignition can occur.

NFPA reactivity

: 0 - Material that in themselves are normally stable, even under fire conditions.



Hazard Rating

Health

: 0 Minimal Hazard - No significant risk to health

Flammability

: 1 Slight Hazard - Materials that must be preheated before ignition will occur. Includes liquids, solids and semi solids having a flash point above 200 F. (Class IIIB)

Physical

: 0 Minimal Hazard - Materials that are normally stable, even under fire conditions, and will NOT react with water, polymerize, decompose, condense, or self-react. Non-Explosives.

Safety Data Sheet (SDS), USA

Important Note: Please note that the information contained herein is furnished without warranty of any kind. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances. The information contained herein may change without prior notice. THIS SAFETY DATA SHEET SUPERSEDES ALL PREVIOUS EDITIONS.