

CITROFOL® BII

Version 1.2 Revision Date:
US / EN 12/07/2022

SDS Number:
100000000012

Date of last issue: 08/10/2020
Date of first issue: 02/28/2018

SECTION 1. IDENTIFICATION

Product name : CITROFOL® BII

Substance name : Tributyl O-acetylcitrate

Molecular formula : C20-H34-O8

Chemical identity : Tributyl 2-acetoxyp propane-1,2,3-tricarboxylate

CAS-No. : 77-90-7

Chemical nature : Liquid

Manufacturer or supplier's details**Details of the supplier of the safety data sheet**

Company : Jungbunzlauer Inc.
95 Wells Avenue, Suite 150
Newton, Massachusetts 02459
USA
www.jungbunzlauer.com

Telephone : +1 617 969-0900

Telefax : +1 617 964-2921

E-mail address : msds@jungbunzlauer.com

Responsible/issuing person

Emergency telephone number

National Chemical Emergency Centre (NCEC)
+1 202 464 2554

Recommended use of the chemical and restrictions on use

Recommended use : Industrial use
Adhesives, sealants
Coatings and paints, thinners, paint removers
Fillers, putties, plasters, modelling clay
Finger paints
Raw materials for paint
Plasticiser
Cosmetic additive
Pharmaceutical raw material
Use in agriculture
Degreasing agent

Restrictions on use : None known.

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SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Not a hazardous substance or mixture.

GHS label elements

Not a hazardous substance or mixture.

Hazards Not Otherwise Classified

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture	: Substance
Chemical nature	: Liquid
Substance name	: Tributyl O-acetylcitrate
CAS-No.	: 77-90-7

SECTION 4. FIRST AID MEASURES

General advice	: Do not leave the victim unattended.
If inhaled	: If unconscious, place in recovery position and seek medical advice. If symptoms persist, call a physician.
In case of skin contact	: Wash off with plenty of water.
In case of eye contact	: Remove contact lenses. Protect unharmed eye. If eye irritation persists, consult a specialist. Immediately flush eye(s) with plenty of water.
If swallowed	: Keep respiratory tract clear. Do not give milk or alcoholic beverages. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician.
Most important symptoms and effects, both acute and delayed	: No information available. None known.
Notes to physician	: Treat symptomatically.

SECTION 5. FIREFIGHTING MEASURES

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- | | |
|---|---|
| Suitable extinguishing media | : Water spray
Dry powder
Foam
Carbon dioxide (CO ₂) |
| Unsuitable extinguishing media | : none |
| Specific hazards during firefighting | : Do not allow run-off from fire fighting to enter drains or water courses. |
| Hazardous combustion products | : Carbon monoxide, carbon dioxide and unburned hydrocarbons (smoke). |
| Further information | : Standard procedure for chemical fires.
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Collect contaminated fire extinguishing water separately. This must not be discharged into drains.
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

In the event of fire and/or explosion do not breathe fumes. |
| Special protective equipment for firefighters | : Wear self-contained breathing apparatus for firefighting if necessary.

Use personal protective equipment.

Wear fire resistant or flame retardant clothing. |
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SECTION 6. ACCIDENTAL RELEASE MEASURES

- | | |
|---|---|
| Personal precautions, protective equipment and emergency procedures | : Avoid contact with eyes.
Avoid inhalation of vapour or mist.
Ensure adequate ventilation, especially in confined areas.
Refer to protective measures listed in sections 7 and 8. |
| Environmental precautions | : Prevent product from entering drains.
If the product contaminates rivers and lakes or drains inform respective authorities. |
| Methods and materials for containment and cleaning up | : Wipe up with absorbent material (e.g. cloth, fleece).
Keep in suitable, closed containers for disposal. |
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SECTION 7. HANDLING AND STORAGE

- | | |
|---|---|
| Advice on protection against fire and explosion | : Normal measures for preventive fire protection. |
| Advice on safe handling | : For personal protection see section 8. |
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Smoking, eating and drinking should be prohibited in the application area.

Conditions for safe storage : Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Electrical installations / working materials must comply with the technological safety standards.

Materials to avoid : No materials to be especially mentioned.

Further information on storage stability : No decomposition if stored and applied as directed.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION**Components with workplace control parameters**

Contains no substances with occupational exposure limit values.

Personal protective equipment

Respiratory protection : No personal respiratory protective equipment normally required.

In the case of vapour formation use a respirator with an approved filter.

Use NIOSH approved respiratory protection.

Hand protection
Remarks : Choose gloves to protect hands against chemicals depending on the concentration and quantity of the hazardous substance and specific to place of work. For special applications, we recommend clarifying the resistance to chemicals of the aforementioned protective gloves with the glove manufacturer.

Eye protection : Safety glasses

Skin and body protection : Protective suit

Hygiene measures : General industrial hygiene practice.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : liquid

Colour : colourless, light yellow, clear

Odour : characteristic

Odour Threshold : Not relevant

pH : Not applicable

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Melting point/range	: -112 °F / -80 °C (1,013 hPa)
Pour point	-71 °F / -57 °C (1,013 hPa)
Boiling point/boiling range	: 628 °F / 331 °C (976.4 hPa) Method: OECD Test Guideline 103
Flash point	: 424.2 °F / 217.9 °C (1,017 hPa) Method: ASTM D 93
Upper explosion limit / Upper flammability limit	: No data available
Lower explosion limit / Lower flammability limit	: No data available
Vapour pressure	: 0.049 Pa (77 °F / 25 °C) Calculation
Relative vapour density	: No data available
Relative density	: 1.046 (77 °F / 25 °C) Method: OECD Test Guideline 109
Density	: 1.0528 g/cm ³ (68 °F / 20 °C)
Solubility(ies)	
Water solubility	: 4.49 mg/l (68 °F / 20 °C)
Solubility in other solvents	: soluble Solvent: Ether soluble Solvent: Alcohol
Partition coefficient: n-octanol/water	: log Pow: 4.86 (104 °F / 40 °C) pH: 7.1 Method: Regulation (EC) No. 440/2008, Annex, A.8
Auto-ignition temperature	: No data available
Decomposition temperature	: No decomposition if stored and applied as directed.
Viscosity	
Viscosity, dynamic	: No data available
Viscosity, kinematic	: 40.4 mm ² /s (68 °F / 20 °C) Method: OECD Test Guideline 114

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Explosive properties	: Not explosive
Oxidizing properties	: No oxidising effect.
Molecular weight	: 402.48 g/mol
Particle size	: Not applicable

SECTION 10. STABILITY AND REACTIVITY

Reactivity	: No decomposition if stored and applied as directed.
Chemical stability	: No decomposition if stored and applied as directed.
Possibility of hazardous reactions	: Stable under recommended storage conditions. No hazards to be specially mentioned.
Conditions to avoid	: Continuous exposure to moist air
Incompatible materials	: Oxidizing agents
Hazardous decomposition products	: Carbon monoxide, carbon dioxide and unburned hydrocarbons (smoke).

SECTION 11. TOXICOLOGICAL INFORMATION**Acute toxicity**

Not classified based on available information.

Non-hazardous ingredients:**Tributyl O-acetylcitrate:**

Acute oral toxicity	: LD50 Oral (Rat): > 31.500 mg/kg body weight Test substance: Tributyl O-acetylcitrate Remarks: No adverse effect has been observed in acute toxicity tests. LD50 Oral (Cat): > 50.000 mg/kg body weight Test substance: Tributyl O-acetylcitrate Remarks: No adverse effect has been observed in acute toxicity tests.
Acute inhalation toxicity	: No data available
Acute dermal toxicity	: LD50 Dermal (Rabbit, male): > 1000 mg/kg body weight Test substance: Tributyl O-acetylcitrate Assessment: The substance or mixture has no acute dermal toxicity

Skin corrosion/irritation

Not classified based on available information.

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Non-hazardous ingredients:**Tributyl O-acetylcitrate:**

Species : Rabbit
Exposure time : 4 d
Result : No skin irritation
Test substance : Tributyl O-acetylcitrate

Serious eye damage/eye irritation

Not classified based on available information.

Non-hazardous ingredients:**Tributyl O-acetylcitrate:**

Species : Rabbit
Result : Not classified
Exposure time : 72 h
Test substance : Tributyl O-acetylcitrate
Remarks : Mild eye irritation

Respiratory or skin sensitisation**Skin sensitisation**

Not classified based on available information.

Respiratory sensitisation

Not classified based on available information.

Non-hazardous ingredients:**Tributyl O-acetylcitrate:**

Test Type : Maximisation Test
Exposure routes : Skin contact
Species : Guinea pig
Result : Does not cause skin sensitisation.
Test substance : Tributyl O-acetylcitrate

Germ cell mutagenicity

Not classified based on available information.

Non-hazardous ingredients:**Tributyl O-acetylcitrate:**

Genotoxicity in vitro : Test Type: Ames test
Test system: Salmonella typhimurium
Concentration: 9 - 495 µg/plate
Method: OECD Test Guideline 471
Result: negative
Test substance: Tributyl O-acetylcitrate

Test Type: in-vitro Mouse Lymphoma Assay
Test system: mouse lymphoma cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476

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Result: negative
Test substance: Tributyl O-acetylcitrate

Genotoxicity in vivo : Test Type: Chromosomal aberration
Species: Rat
Application Route: Oral
Dose: 2000 mg/kg bw
Method: OECD Test Guideline 475
Result: negative
Test substance: Tributyl O-acetylcitrate

Germ cell mutagenicity - Assessment : Not mutagenic in Ames Test

Did not show carcinogenic, teratogenic or mutagenic effects in animal experiments.

Carcinogenicity

Not classified based on available information.

Non-hazardous ingredients:**Tributyl O-acetylcitrate:**

Species : Rat, male and female
Application Route : Oral
Exposure time : 24 month(s)
Dose : 0, 100, 300, 1000 mg/kg body weight
NOAEL : 1,000 mg/kg bw/day
Result : negative
Symptoms : No adverse effects
Test substance : Tributyl O-acetylcitrate

IARC No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

NTP No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity

Not classified based on available information.

Non-hazardous ingredients:**Tributyl O-acetylcitrate:**

Effects on fertility : Species: Rat
Application Route: Oral
General Toxicity - Parent: NOAEL: 250 mg/kg bw/day

STOT - single exposure

Not classified based on available information.

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Non-hazardous ingredients:**Tributyl O-acetylcitrate:**

Remarks : No data available

STOT - repeated exposure

Not classified based on available information.

Non-hazardous ingredients:**Tributyl O-acetylcitrate:**

Remarks : No data available

Repeated dose toxicity**Non-hazardous ingredients:****Tributyl O-acetylcitrate:**

Species : Rat, male and female
NOAEL : ca. 300 - 1.000 mg/kg bw/day
Application Route : Oral
Exposure time : 12 months
Dose : 0, 100, 300, 1000 mg/kg bw/day
Test substance : Tributyl O-acetylcitrate
Symptoms : No adverse effects

Aspiration toxicity

Not classified based on available information.

Non-hazardous ingredients:**Tributyl O-acetylcitrate:**

No data available

Experience with human exposure**Product:**

Inhalation : Target Organs: Respiratory system
Symptoms: No information available.

Skin contact : Target Organs: Skin
Symptoms: No information available.

Eye contact : Target Organs: Eyes
Symptoms: No information available.

Ingestion : Target Organs: Digestive organs
Symptoms: No information available.

Further information**Product:**

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Remarks : No data available

SECTION 12. ECOLOGICAL INFORMATION**Ecotoxicity****Non-hazardous ingredients:****Tributyl O-acetylcitrate:**

Toxicity to fish : LC50 (Lepomis macrochirus (Bluegill sunfish)): 38 mg/l
Exposure time: 96 h
Test Type: flow-through test
Test substance: Tributyl O-acetylcitrate
Method: OECD Test Guideline 203

LC50 (Fish): 59 mg/l
Exposure time: 96 h
Test Type: flow-through test
Test substance: Tributyl O-acetylcitrate

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 1 mg/l
Exposure time: 24 h
Test Type: static test
Test substance: Tributyl O-acetylcitrate
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : EC50 (Desmodesmus subspicatus (green algae)): 11.5 mg/l
End point: Biomass
Exposure time: 72 h
Test Type: Growth inhibition
Test substance: Tributyl O-acetylcitrate
Method: OECD Test Guideline 201

NOEC: 4.65 mg/l

Toxicity to microorganisms : EC10 (activated sludge): > 1,000 mg/l
Exposure time: 3 h
Test Type: Respiration inhibition
Test substance: Tributyl O-acetylcitrate
Method: OECD Test Guideline 209

Persistence and degradability**Components:****Tributyl O-acetylcitrate:**

Biodegradability : Inoculum: activated sludge
Result: Inherently biodegradable
Biodegradation: 82 %
Exposure time: 28 d
Method: OECD Test Guideline 302C
Test substance: Tributyl O-acetylcitrate

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Closed Bottle test
Result: Not rapidly biodegradable
Biodegradation: 16 %
Exposure time: 28 d
Method: OECD Test Guideline 301D
Test substance: Tributyl O-acetylcitrate

Bioaccumulative potential**Components:****Tributyl O-acetylcitrate:**

Bioaccumulation : Bioconcentration factor (BCF): 31.57
Method: The value is calculated

Partition coefficient: n-octanol/water : log Pow: 4.86 (104 °F / 40 °C)
pH: 7.1
Method: OECD Test Guideline 117

Mobility in soil**Components:****Tributyl O-acetylcitrate:**

Distribution among environmental compartments : Adsorption/Soil
Medium: Soil
Koc: 18664, log Koc: 4.271
Method: OECD Test Guideline 121

Stability in soil : Remarks: Readily biodegradable.

Other adverse effects**Product:**

Ozone-Depletion Potential : Regulation: 40 CFR Protection of Environment; Part 82
Protection of Stratospheric Ozone - CAA Section 602 Class I Substances
Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

Additional ecological information : An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Harmful to aquatic life.

Non-hazardous ingredients:**Tributyl O-acetylcitrate:**

Results of PBT and vPvB assessment : This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating

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(vPvB).

SECTION 13. DISPOSAL CONSIDERATIONS**Disposal methods**

Waste from residues : In accordance with local and national regulations.
Where possible recycling is preferred to disposal or incineration.

The product should not be allowed to enter drains, water courses or the soil.

SECTION 14. TRANSPORT INFORMATION**International Regulations****IATA-DGR**

Not regulated as a dangerous good

IMDG-Code

Not regulated as a dangerous good

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

Not applicable for product as supplied.

National Regulations**DOT**

Not regulated as a hazardous material

TDG

Not regulated as a dangerous good

Special precautions for user

Not applicable

SECTION 15. REGULATORY INFORMATION**CERCLA Reportable Quantity**

This material does not contain any components with a CERCLA RQ.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards : No SARA Hazards

SARA 313 : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

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Clean Air Act

This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCM Intermediate or Final VOC's (40 CFR 60.489).

Clean Water Act

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.

This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.

This product does not contain any toxic pollutants listed under the U.S. Clean Water Act Section 307

This product does not contain any priority pollutants related to the U.S. Clean Water Act

US State Regulations**Massachusetts Right To Know**

No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know

Tributyl O-acetylcitrate

77-90-7

Maine Chemicals of High Concern

Product does not contain any listed chemicals

Vermont Chemicals of High Concern

Product does not contain any listed chemicals

Washington Chemicals of High Concern

Product does not contain any listed chemicals

The components of this product are reported in the following inventories:

TCSI	:	On the inventory, or in compliance with the inventory
TSCA	:	All substances listed as active on the TSCA inventory
AIIC	:	On the inventory, or in compliance with the inventory
DSL	:	All components of this product are on the Canadian DSL
ENCS	:	On the inventory, or in compliance with the inventory
ISHL	:	On the inventory, or in compliance with the inventory
KECI	:	On the inventory, or in compliance with the inventory
PICCS	:	On the inventory, or in compliance with the inventory
IECSC	:	On the inventory, or in compliance with the inventory
NZIoC	:	On the inventory, or in compliance with the inventory

TSCA list

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

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SECTION 16. OTHER INFORMATION**Full text of other abbreviations**

AIIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Items where relevant changes have been made to the previous version are highlighted in the body of this document by two vertical lines, red letters and grey shading.

Revision Date : 12/07/2022

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

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