

# MATERIAL SAFETY DATA SHEET

JUNGBUNZLAUER INC.  
Product: CITROFOL® AI

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Review Date: 11/16/2009

## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

|                                       |   |
|---------------------------------------|---|
| COMMERCIAL PRODUCT NAME               | CITROFOL® AI  |
| COMPANY/SUPPLIER                      | Jungbunzlauer Inc.<br>7 Wells Avenue<br>Newton Centre, MA 02459                     |
| Emergency Phone                       | 1- 617-969-0900; 8:30 - 5:00 M-F Eastern Time                                       |
| <b>24 Hour Emergency Phone Number</b> | <b>CHEMTREC 1-800-424-9300</b>  |
| Product use                           | Plasticizer, solvent, egg white whipping aid, fixative, deodorant active ingredient |

## 2. COMPOSITION, INFORMATION ON INGREDIENTS

|                           |  |
|---------------------------|--|
| Chemical name             | Triethyl Citrate   |
| Chemical characterization | $C_{12}H_{20}O_7$<br>1,2,3-Propanetricarboxylic acid, 2-hydroxy-, triethyl ester |
| Chemical family           | organic Acid Ester   |
| Synonyms                  | Triethyl citrate, TEC, TEC plasticizer   |
| <b>COMPOSITION</b>        | <b>CAS Reg. No.</b> <b>%</b>   |
| Triethyl Citrate          | 77-93-0                              100   |
| Hazardous impurities      | None   |
| EINECS-No.                | 201-070-7  |
| E-No.                     | E 1505   |

## 3. HAZARDS IDENTIFICATION

|                       |                                 |
|-----------------------|---------------------------------|
| Most important Hazard | None                            |
| Emergency Overview    | Colorless, slightly oily liquid |
| Inhalation            | No data available               |
| Eye contact           | No data available               |
| Skin contact          | No data available               |
| Ingestion             | No data available               |
| Chronic               | No data available               |
| Carcinogen status     | None                            |

## 4. FIRST AID MEASURES

|                            |   |
|----------------------------|---|
| General advice you         | No hazards which require special first aid measures. If feel unwell, seek medical advice. |
| Inhalation                 | Move to fresh air. If symptoms persist, call a physician.                                 |
| Skin contact               | Wash off with soap and plenty of water. If skin irritation persists, call a physician.    |
| Eye contact                | Flush eyes with water as a precaution. If eye irritation persists, consult a specialist.  |
| Ingestion                  | Drink water as a precaution. Consult a physician if necessary                             |
| Protection of first-aiders | No hazards which require special first aid measures.                                      |

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## 5. FIRE FIGHTING MEASURES

|   |   |
|---|---|
| Flash point   | 151°C   |
| Flammable limits  | Not available   |
| Autoignition temperature                                      | Not available   |
| Suitable extinguishing media                                  | water, water spray, dry powder, foam, carbon dioxide (CO2)  |
| Extinguishing media which must not be used for safety reasons | None  |
| Hazardous decomposition products                              | carbon oxides   |
| Special protective equipment                                  | Use personal protective equipment including self-contained breathing apparatus when fighting fire in enclosed area. |
| Specific methods  | Standard procedure for chemical fires.  |

## 6. ACCIDENTAL RELEASE MEASURES

|                              |   |
|------------------------------|---|
| Personal precautions         | Use personal protective equipmt. Avoid dust formation.  |
| Environmental precautions    | Do not allow material to contaminate ground water system.   |
| Methods for cleaning up gel, | Soak up with inert absorbent material (e.g. sand, silica acid binder, universal binder, sawdust). |

## 7. HANDLING AND STORAGE

### HANDLING

|                                       |   |
|---------------------------------------|---|
| Technical measures/Precautions        | Use only in area provided with appropriate exhaust ventilation. |
| Safe handling advice                  | Use personal protective equipment.                              |
| <b>STORAGE</b>                        |   |
| Technical measures/Storage conditions | Keep tightly closed in a dry and cool place.                    |
| Incompatible products                 | No special restrictions on storage with other products.         |
| Packaging material                    | Intermediate Bulk Container (IBC), Iron drums                   |

## 8. EXPOSURE CONTROLS, PERSONAL PROTECTION

|                               |   |
|-------------------------------|---|
| Engineering measures          | Ensure adequate ventilation, especially in confined areas.            |
| Exposure limit(s)             | None established for this ingredient,                                 |
| Personal protection equipment |   |
| Respiratory protection        | No personal respiratory protective equipment normally required        |
| Hand protection               | Impervious gloves, break through time >8 hours                        |
| Eye Protection                | Safety glasses with side shields                                      |
| Skin and body protection      | Lightweight protective clothing                                       |
| Hygiene measures              | Handle in accordance with good industrial hygiene and safety practice |

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

|                                       |                               |
|---------------------------------------|-------------------------------|
| Form                                  | liquid                        |
| Color                                 | colorless/translucent         |
| Odor                                  | slight                        |
| pH                                    | not available                 |
| Vapor pressure (25°C)                 | 1.89 x 10 <sup>-3</sup> mm Hg |
| Vapor density                         | 9.7                           |
| Boiling point                         | 294°C                         |
| Boiling point range (1mmHg)           | 127°C                         |
| Pour point                            | -45.5°C                       |
| Decomposition temperature             | >200°C                        |
| Evaporation rate                      | < 1 vs. butyl acetate         |
| Coefficient of water/oil distribution | not available                 |
| Melting point/range                   | not available                 |
| Relative density                      | 1.135 g/cm <sup>3</sup>       |
| Explosive properties                  | None when properly stored     |
| Water solubility (25°C)               | 65 g/kg                       |
| Solubility in other solvents          |                               |
| Alcohol                               | soluble                       |
| Acetone                               | soluble                       |
| Viscosity (25°C)                      | 35.2 mPa.s                    |

## 10. STABILITY AND REACTIVITY

|                                  |  |
|----------------------------------|--|
| Stability                        | Stable at normal conditions  |
| Conditions to avoid              | none under normal use. Hydrolyses in presence of aqueous solution of alkali salts                              |
| Materials to avoid               | Incompatible with strong bases and oxidizing agents.   |
| Hazardous decomposition products | No decomposition if stored normally. Thermal decomposition can lead to release of irritating gases and vapors. |

## 11. TOXICOLOGICAL INFORMATION

|                       |   |
|-----------------------|---|
| Acute toxicity        | LD50/p.o./rat >32 g/kg bw(1)<br>LD50/i.p./mouse = 1.75 g/kg bw(2)   |
| Local effects         | No skin irritation and no eye irritation (rabbit) (3)   |
| Chronic toxicity      | Did not show carcinogenic effects in animal experiments.<br>NOEL (no-observed-effect-level) =100 mg/kg bw (3)                                   |
| Reproductive toxicity | Did not show mutagenic effects in animal experiments (3)<br>Not mutagenic in AMES Test (4)  |
| Human experience      | Health injuries are not known or expected under normal use.<br>Patch test on human volunteers did not demonstrate sensitization properties. (5) |

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## 12. ECOLOGICAL INFORMATION

|                               |  |
|-------------------------------|--|
| Mobility                      | No information available   |
| Persistence and degradability | Readily biodegradable, according to OECD test. <sup>(6)</sup>  |
| Ecotoxicity                   | This product has no known eco-toxicological effects.<br>EC50/72h/algae = G <sub>a</sub> 1 <sup>(6)</sup><br>LC50/96h/golden orfe = 450 mg/l <sup>(7)</sup><br>EC10/18h/bacteria => 100,000 mg/L <sup>(9)</sup> |

## 13. DISPOSAL CONSIDERATIONS

|                                     |  |
|-------------------------------------|--|
| Waste from residues/unused products | Can be landfilled or incinerated when in compliance with local, state and federal laws and regulations (contact local or state environmental agency for specific rules). |
| Contaminated packaging recycling    | Empty containers should be transported/delivered for local or waste disposal   |

## 14. TRANSPORT INFORMATION

Not a Hazardous Material for DOT shipping.

## 15. REGULATORY INFORMATION

is generally regarded as safe (GRAS) by USA FDA. 21 CFR 182.1911  
The ingredient is listed on the TSCA Inventory List.  
European Food Additive, E 1505  
CERCLA (Comprehensive Response Compensation, and Liability Act): Not hazardous  
SARA Title III (Superfund Amendments and Reauthorization Bill): Not Considered Hazardous  
USP-NG listed; Ph.Eur. Listed, FEMA (3083), JECFA Flavoring agent 629  
Foreign Inventory Status: Canadian DSL (Domestic Substance List)

## 16. OTHER INFORMATION

|              |            |     |
|--------------|------------|-----|
| HMIS* Rating | Health     | = 1 |
|              | Fire       | = 1 |
|              | Reactivity | = 0 |

\*Hazardous Material Information System of the National Paint and Coating Association.

Sources of key data used to compile the datasheet

- (1) M.Finklestein&H.Gold, Toxic. Appl. Pharmac. (1959)1, 283
- (2) D.B. Meyers et all, J. pharm. Sci. (1964) 53, 774
- (3) CSTE (1999) 11th Plenary meeting on 28.9.99
- (4) J.L.Heath&M.Reilly, Poult. Sci. (1982) 61, 2517
- (5) Hill Top Research Report 77-1035A-71 for Pfizer Inc. (1978)
- (6) Jungbunzlauer 1994, DIN 38 412 L 25
- (7) Universität des Saarlandes for Jungbunzlauer 3/95, DIN 38412 L 33
- (8) Universität des Saarlandes for Jungbunzlauer 3/95, DIN 38412 L 15
- (9) Universität des Saarlandes for Jungbunzlauer 3/95, Cell inhibition test DIN 38412 L8

MSDS Status: Reviewed 11/16/2009.

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