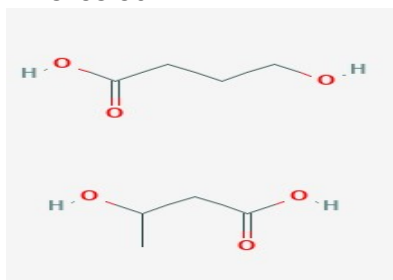


Safety Data Sheet CB0104A

Section1-Identification of the substance and of the company/undertaking

1.1 Product identifier

| | |
|---------------------------|--|
| Trade name | CB0104A |
| Substance name | Poly(3-hydroxybutyrate-co-4-hydroxybutyrate) |
| CAS No. | : 125495-90-1 |
| Chemical structure | |



Poly(3-hydroxybutyrate-co-4-hydroxybutyrate)

1.2 Relevant identified uses of the substance or mixture and uses advised against

1.2.1 Relevant identified uses : Applications requiring bio content and/or composting/biodegradability

1.2.2 No additional information available

No additional information available

1.3 Details of the supplier of the safety data sheet

Manufacturer CJ Biomaterials
19 Presidential Way; Suite 301. Woburn, MA 01801 USA

1.4 Emergency telephone number

Emergency number :82-2- 6740-1137, 82-31-8099-2353

Section2-Hazards identification

2.1 Hazards

2.1.1 Classification of the substance or mixture

Flammability GHS Category 4-Slight hazard
 Not considered a hazards substance or mixture
 Not considered hazardous according to OSHA
 Not considered hazardous according to EC Directives 67/548EEC or 1999/45/EC and their



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valid adaptation and derived national regulation

2.1.2 GHS Label elements, including precautionary statements

Not relative as material in not a hazardous substance or mixture

2.1.3 Hazards not otherwise classified (HNOC) or not covered by GHS

Will not ignite by friction

Slightly flammable if subjected to open flame (see sec. 16, additional information)

2.2 Potential Health Effects

Eye : May cause eye irritation

Skin : May cause skin irritation. Under normal processing conditions at elevated temperature, contact with molten material can cause thermal burns

Ingestion : May be harmful if swallowed

Inhalation : Dust from processing may cause irritation of the respiratory system

Section3 - Information on Ingredients

Polyhydroxyalkanoate (P3HB4HB) CAS# 125495-90-1

Section4 – First Aid Measures

Eye : Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid

Skin : Wash off with soap and water

Ingestion : Get medical aid immediately. Do not induce vomiting without medical advice

Inhalation : Heating resin above the recommended processing range, or 220 °C will produce toxic fumes. Remove the victim from exposure area to fresh air immediately. Give oxygen if breathing is difficult. Get medical aid. Give artificial respiration if not breathing.

Notes to Physician : Treat symptomatically and supportively.

Section5– Fire Fighting Measure

Extinguishing Media :Use water spray, dry chemical, carbon dioxide, or chemical foam

Flash Point :Not determined

Auto-ignition Temp. :Not determined

Hazardous Combustion Product

: carbon dioxide, carbon monoxide

Special Protective Actions for fire-fighters

:Wear a self-contained breathing apparatus in pressure-demand mode, MSHA/NIOSH (approved or equivalent), and full protective gear

Section6– Accidental Release Measures

Non-emergency personnel

: Use personal protective equipment as indicated in Section 8. Ventilate area



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Spills / Leaks

: Sweep up pellets. Vacuum fines, or dusts, using a combustible-dust vacuum

For emergency responders

:Some as above for non-emergency personals

Section7– Handling and Storage

Handling

: Good industrial practices in housekeeping and personal hygiene should be followed. Minimize dust. Maintain operating temperature within the recommended processing range. Avoid contact with molten material and provide adequate ventilation during processing. When mechanical energy is used to process, or transfer, the materials, fines or dust can be generated. Systems and procedures should be designed to minimize the generation and accumulation of dust from the handling and processing of a mixed resin of PHA and PLA. Refer to NFPA pamphlet 654: Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, processing, handling of Combustible Particulate Solids.

Storage

: A mixed resin of PHA and PLA has good storage stability, but extremes of temperature and humidity should be avoided to prevent property deterioration. The recommended maximum shelf life is two years. Resin should be stored in original shipping package. Keep the resin dry and sealed to exclude moisture. Store below 27 °C (80 °F) to maximize product shelf life.

Section8– Exposure controls /Personal Protection

8.1 Control Parameters

OSHA Vacated PELs

: No OSHA Vacated PELs are listed for this chemical

Engineering Controls

: Provided good general ventilation with additional local ventilation where the hot polymer may reside for long periods (leak areas, above the nozzle or die, in screen changers, in vent ports, etc.). Heating resin above recommended processing conditions or 220 °C will produce toxic fumes.

8.2 Personal Protective Equipment

Eyes

: Wear appropriate protective eyeglasses described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166

Skin

: Hot polymers can cause thermal burns. Wear impervious clothing and insulated gloves where exposure to molten polymer is possible.

Respirators

: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if there is potential for exposure to dust or toxic fumes, or if irritation or other symptoms are experienced.

Section9– Physical and Chemical Properties

| | |
|---|--|
| Appearance | : Off-white solid pellets |
| Odor | : mild |
| Odor threshold | : not determined |
| pH | : not applicable |
| Melting Point | : 100 °C-190 °C (212 °F to 374 °F) |
| Freezing Point | : not applicable |
| Boiling Point | : not applicable |
| Flash Point | : not determined |
| Evaporation rate | : not determined |
| Vapor Pressure | : not determined |
| Vapor Density | : not determined |
| Viscosity | : not available |
| Flammability | : data not available |
| Upper / lower flammability or explosive limits | : (min. explosible concentration) 160 g/m ³ |
| Vapor Pressure | : not determined |
| Vapor Density | : not determined |
| Density | : 1.1-1.3 g/cm ³ |
| Solubility | : soluble in chloroform, methylene chloride, |
| Partition coefficient | : not determined |
| Auto-ignition Temperature | : not determined |
| Decomposition Temperature | : above 220 °C (428 °F) |
| Viscosity | : not applicable-solid |
| Molecular Weight | : approximately >100,000 (by GPC) |

Section10– Stability and Reactivity

| | |
|--|---|
| Reactivity | : not known to be reactive |
| Chemical Stability | : stable under recommended storage conditions. See section 7 |
| Possibility of Hazardous Reaction | : hazardous polymerization will not occur |
| Conditions to Avoid | : incompatible materials, excess heat, flames, ignition sources |
| Incompatible materials | : strong oxidizing agents, strong acids |
| Hazardous Decomposition | : carbon monoxide, carbon dioxide, crotonic acid |

Section11– Toxicological Information

| | |
|--|---|
| Acute toxicity | : Category 5 (dermal) |
| Skin Corrosion / irritation | : Classified as a mild sensitizer for skin |
| Serious Eye Damage / irritation | : not classified |
| Respiratory or Skin Sensitization | : no information available |
| Mutagenicity | : no information available : Negative on in vitro bacterial reverse mutation, Negative |



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| | |
|-------------------------------|---|
| | on in vitro mammalian gene mutation and Negative on in vivo chromosome aberration |
| Carcinogenicity | : no information available |
| Reproductive toxicity | : no information available |
| STOT-single exposure | : no information available |
| STOT-repeated exposure | : no information available |
| Aspiration hazard | |

Section12 – Ecological Information

- 12.1 Ecological Toxicity** Not considered toxic in marine, fresh water and soil environments
- 12.2 Persistence & Degradability** Product will biodegrade in industrial and home compost conditions
- 12.3. Bioaccumulation** Not expected to bioconcentrate or bioaccumulate.
- 12.4. Mobility in soil** No data available
- 12.5. Other adverse effects** No information available

Section 13 – Disposal Considerations

Waste from residues / unused products: In accordance with local and national Regulations. Product is bio-based, non-hazardous and compostable.

Should not be released into the environment

Contaminated packaging: Empty remaining contents Do not re-use empty containers. Empty containers should be transported/delivered using a registered waste carrier to local recyclers for disposal.

Section14 – Transport Information

U.S. Department of Transportation (DOT):

Proper shipping name: None
Hazard class: Not regulated
UN-No: None
Packing group: None
Hazardous Substances RQs: None

IMDG:

Proper shipping name: None
Hazard class: Not regulated
UN/Id No.: None
Packing group: None

ICAO/IATA:

Proper shipping name: None



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Hazard Class: Not regulated

UN-No.: None

Packing group: None

Section 15. Regulatory Information

(not meant to be all inclusive - selective regulations represented)

Regulatory requirements are subject to change and may differ between locations. It is the User's responsibility to ensure that all activities comply with all federal, state or provincial and local laws and regulations.

U.S. REGULATIONS

TSCA: Listed

California Proposition 65: Not Listed

EU REACH: Exemption

China regulations IECSC GB4806.6-2016: Listed

Japan regulations : Listed

Korea REACH: Exemption

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule

Section 12b

None of the chemicals are listed under TSCA Section 12b

Section 313

No chemicals are reportable under Section 313

Clean Air Act:

This material does not contain any hazardous air pollutants

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substance under the CWA

None of the chemicals in this product are listed as Priority Pollutants under the CWA

None of the chemicals in this product are listed as Toxic Pollutants under the CWA

OSHA

None of the chemicals in this product are considered highly hazardous by OSHA

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

EUROPEAN UNION

Not considered hazardous according to EC Directives 67/548/EEC or 1999/45/EC and their valid adaptations and derived national regulations

European labeling in Accordance with EC Directives



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CANADIAN REGULATIONS

Canada -DSL

CAS# 125495-90-1

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the SDS contains all of the information required by those regulations.

Canada -NDSL

CAS# 9051-89-2

Substances on the list still require notification under the New Substances Notification Regulations (Chemicals and Polymers) so that health and ecological risks can be assessed before the substance is manufactured or imported into Canada above threshold quantities, however they are subject to fewer information requirements and higher thresholds for reporting.

Section16 – Additional Information

Product Name: PHACT CB0104A

HMIS Classification (estimated)

Health hazard: 0

Physical hazards: 0

NFPA Rating (estimated)

Health hazard: 0

Fire: 1

Reactivity: 0

NOTICE: Customer assumes all risk with respect to its use and handling of this resin and its marketing, sale and use of products made with CJ CHEILJEDANG biopolymers. CJ CHEILJEDANG liability for branch of warranty, negligence, or other claims is limited to the purchase price of materials purchased. CJ CHEILJEDANG will not be responsible for any indirect, consequential, special, or incidental damages. The information contained herein is believed to be reliable, but CJ CHEILJEDANG makes NO REPRESENTATIONS, GUARANTEES, OR WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

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