Date of issue: 7 April 2020

Trade name: BRONTIDE Natural Butylene Glycol

SECTION 1: Identification

Product identifier used on the label:
Product Name: 1,3-Butylene glycol (13BG).

Other means of identification:
Chemical Name: (R)-(-)-1,3-Butylene glycol
CAS: 6290-03-5
REACH registration No: 01-2120764879-30-0000
Synonyms: (R)-(-)-1,3-Butanediol , (R)-(-)-Butane-1,3-diol, (R)-(-)-1,3-Dihydroxybutane, 13BG, BG, R-13BG
SDS number: GEN004

Recommended use of the chemical and restrictions on use:
Recommended use: Formulation into cosmetic and food products
Use as components in pharmaceuticals
Use in cleaning products by consumers and workers

Recommended restrictions: Not intended for human consumption.

Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party:

Company Name: Genomatica, Inc.
Company Address: 4757 Nexus Center Drive
San Diego, CA 92121
Company Telephone: (858) 652-5349

Company Contact Name: Kyle Huston
E-mail address: brontide@genomatica.com

For product information call: [+1 858-652-5379]
For emergencies only. Call CHEMTREC: +1 703-741-5970

SECTION 2: Hazard(s) identification

Classification of the chemical in accordance with paragraph (d) of §1910.1200:

Physical hazards
No physical hazards under GHS.

Health hazards
Skin irritation, Category 2.
Eye irritation, Category 2A.
Specific target organ toxicity - single exposure, Category 3, Respiratory system.

Environmental hazards
No environmental hazards under GHS

GHS Signal word: **WARNING.**

GHS Hazard statement(s):
H315 - Causes skin irritation.
H319 - Causes serious eye irritation.
H335 - May cause respiratory irritation.

GHS Hazard symbol(s):

GHS Precautionary statement(s):

Prevention:
- Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray.
- Wash skin thoroughly after handling.
- Use only outdoors or in a well-ventilated area.
- Wear protective gloves/ eye protection/ face protection.

Response:
- If on skin: Wash with plenty of water
- If inhaled: Remove person to fresh air and keep comfortable for breathing.
- If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- Call a poison center/doctor if you feel unwell.
- Specific treatment (see supplemental first aid instructions on this label).
- If skin irritation occurs: Get medical advice/ attention.
- If eye irritation persists: Get medical advice/ attention.
- Take off contaminated clothing and wash it before reuse.

Storage:
- Store in a well-ventilated place. Keep container tightly closed.
- Store locked up.

Disposal:
- Dispose of contents/containers to an approved disposal site in accordance with local/regional/national/international regulations.

Hazard(s) not otherwise Classified (HNOC): None known.

Percentage of ingredient(s) of unknown acute toxicity:
100% of the mixture consists of ingredients of unknown acute toxicity (oral/dermal/inhalation).

SECTION 3: Composition/information on ingredients

Pure Substance:

Chemical name	CAS#	Concentration (weight %)
1,3-Butylene glycol	6290-03-5	< 100%

The balance of the ingredients are not classified as hazardous or are below the concentration limit to be classified as hazardous, under the criteria of the Federal OSHA Hazard Communication Standard 29CFR 1910.1200.

SECTION 4: First-aid Measures

Description of necessary measures, subdivided according to the different routes of exposure, i.e., inhalation, skin and eye contact, and ingestion:

Inhalation: If inhaled, remove person into fresh air. Give oxygen or artificial respiration as needed. Obtain emergency medical attention.

Skin contact: Remove contaminated clothing and wash skin with plenty of soap and water. Flush with lukewarm water for 15 minutes. Seek medical attention if ill effect or irritation develops.

Eye contact: Thoroughly flush the eyes with large amounts of clean low-pressure water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation persists, seek medical attention.

Ingestion: Rinse mouth and then drink plenty of water. Do not induce vomiting. Never give anything by mouth if the victim is unconscious or having convulsions. Obtain emergency medical attention.

Most important symptoms/effects, acute and delayed:

May be harmful if inhaled. May cause respiratory tract irritation. May be harmful if absorbed through skin. May cause skin irritation. May cause eye irritation. May be harmful if swallowed.
Signs and symptoms of exposure include gastrointestinal disturbance, nausea, headache, vomiting.

Indication of immediate medical attention and special treatment needed: If any symptoms are observed, contact a physician and give them this SDS sheet. Treat symptomatically. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient.

SECTION 5: Fire-fighting measures

Suitable (and unsuitable) extinguishing media:
Suitable extinguishing media: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
Unsuitable extinguishing media: Do not use full water jet.

Specific hazards arising from the chemical (e.g., nature of any hazardous combustion products): Thermal decomposition may produce carbon monoxide, carbon dioxide and other toxic vapors.

Special protective equipment and precautions for fire-fighters: Wear self-contained breathing apparatus and protective clothing. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures: Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8). See Sections 2 and 7 for additional information on hazards and precautionary measures.

Environmental Precautions: Stop spill/release if it can be done safely. Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Use water sparingly to minimize environmental contamination and reduce disposal requirements. If spill occurs on water notify appropriate authorities and advise shipping of any hazard.

Methods and material for containment and cleaning up:
May contaminate water supplies and pollute public waters. Evacuate and limit access. Equip responders with proper protection. Prevent flow to sewer and public waters. Stop release. Soak up with inert absorbent material such as sand or vermiculite and transfer to suitable, closed containers for disposal. See Section 13 for information on appropriate disposal.

SECTION 7: Handling and Storage

Precautions for safe handling: Keep container tightly closed when not in use. Ensure adequate ventilation. Avoid contact with skin and eyes. Avoid inhalation of vapor or mist.

Conditions for safe storage, including any incompatibles:
Keep containers tightly closed in a dry, cool and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Storage class (TRGS 510): Non Combustible Liquids

SECTION 8: Exposure controls/personal protection

OSHA permissible exposure limit (PEL), American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV), and any other exposure limit used or recommended by the chemical manufacturer, importer, or employer preparing the safety data sheet, where available:

US OSHA HAZARDOUS COMPONENTS (29 CFR 1910.1200): Permissible Exposure Limits			
Substance	**PEL-TWA (8 hour)**	**PEL-STEL (15 min)**	**REMARKS**
1,3-Butylene glycol	None known	None known	

US ACGIH Threshold Limit Values			
Substance	**TLV-TWA**	**TLV-STEL**	**REMARKS**
1,3-Butylene glycol	None known	None known	

Appropriate engineering controls: Provide local exhaust ventilation to control vapors/mists. Ventilation rates should be matched to conditions. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Individual protection measures, such as personal protective equipment:

Eye/face protection: Eye protection such as safety glasses with side-shields and/or face shield must be worn when possibility exists for eye contact due to splashing or spraying liquid, airborne particles, or vapor. Eye protection should be approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin and Hand protection: Wear chemical resisting gloves such as: Nitrile rubber. Depending on the conditions of use, protective gloves, aprons, boots, head and face protection should be worn. The equipment must be cleaned thoroughly after each use.
Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Respiratory protection: Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387)

respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Other: Wash hands before eating, drinking, smoking, or using toilet facilities. Take off contaminated clothing and wash before reuse. Shower after work using plenty of soap and water. Selection of appropriate personal protective equipment should be based on an evaluation of the performance characteristics of the protective equipment relative to the task(s) to be performed, conditions present, duration of use, and the hazards and/or potential hazard that may be encountered during use.

Thermal hazards: None established.

SECTION 9: Physical and chemical properties

Appearance (physical state, color, etc.):	
Physical state:	Liquid
Color:	Clear light yellow
Odor:	Odorless.
Odor threshold:	Not established
pH:	No data available
Melting point/freezing point:	No data available
Initial boiling point and boiling range:	207 - 210 °C (404.6-410 °F) at 31 hPa (23 mmHg) - lit.
Flash point:	108 °C (226 °F) - closed cup
Evaporation rate:	No data available
Flammability (solid, gas):	Not applicable
Upper/lower flammability or explosive limits	
Flammability limit – lower %):	Not applicable
Flammability limit – upper (%):	Not applicable
Explosive limit – lower (%):	Not applicable
Explosive limit – upper (%):	Not applicable
Vapor pressure:	0.08 hPa (0.06 mmHg) at 20 °C (68 °F)
Vapor density (air=1):	3.11
Relative density (water = 1):	1.005 g/cm3 at 25 °C (77 °F)
Solubility(ies):	No data available
Partition coefficient (n-octanol/water):	No data available
Auto-ignition temperature:	394 °C (741 °F)
Decomposition temperature:	Not established
Viscosity @ 25°C:	No data available

SECTION 10: Stability and Reactivity

Reactivity: Stable.

Chemical stability: Stable under recommended storage conditions.

Possibility of hazardous reactions: Not expected to occur.

Conditions to avoid: Incompatible products.

Incompatible materials: Avoid strong oxidizing agents, Acid chlorides, Acid anhydrides, Chloroformates, Reducing agents.

Hazardous decomposition products: In combustion emits toxic fumes of carbon dioxide / carbon monoxide.

SECTION 11: Toxicological information

Information on likely routes of exposure:

Inhalation: May be a route of entry.

Ingestion: May be a route of entry.

Skin: Expected to be a route of entry.

Eyes: Expected to be a route of entry.

Target Organ(s): Eye, skin, respiratory system.

Symptoms related to the physical, chemical, and toxicological characteristics:
May be harmful if inhaled. May cause respiratory tract irritation. May be harmful if absorbed through skin. May cause skin irritation. May cause eye irritation. May be harmful if swallowed.

Delayed and immediate effects and chronic effects from short or long-term exposure:
Signs and symptoms of exposure include gastrointestinal disturbance, nausea, headache, vomiting.

Numerical measures of toxicity (such as acute toxicity estimates):

Ingredient Information:

Substance	Test Type (species)	Value
1,3-Butylene glycol	LD_{50} Oral (Rat)	No data available
	LD_{50} Dermal (Rat)	No data available
	LC_{50} Inhalation (Rat)	No data available

Skin corrosion/irritation: Classified as irritating to the skin. May be harmful if absorbed through skin. May cause skin irritation.

Serious eye damage/eye irritation: Classified irritating to the eyes**.** May cause eye irritation. Effects of eye irritation are reversible.

Respiratory sensitization: Non-sensitizing.

Skin sensitization: Non-sensitizing

Germ cell mutagenicity: Negative

Carcinogenicity: Not classified as a carcinogen. Not listed by IARC, NTP, OSHA or EPA.

Reproductive toxicity: No toxicity.

Specific target organ toxicity-Single exposure: Inhalation - May cause respiratory irritation.

Specific target organ toxicity-Repeat exposure: No data available

Aspiration hazard: No data available

Further information: Signs and symptoms of exposure include gastrointestinal disturbance, nausea, headache, vomiting.

SECTION 12: Ecological information

Ecotoxicity (aquatic and terrestrial, where available):

Product data: No data available.

Ingredient Information:

Substance	Test Type	Species	Value
1,3-Butylene glycol	LC_{50}	Fish	No data available
	EC_{50}	Invertebrate	No data available
	EC_{50}	Algae	No data available

Persistence and Degradability: Not known.

Bioaccumulative Potential: Not known.

Mobility in Soil: Not known.

Other adverse effects (such as hazardous to the ozone layer): Not known.

SECTION 13: Disposal considerations

Description of waste residues and information on their safe handling and methods of disposal, including the disposal of any contaminated packaging:

Product - The product should not be allowed to enter drains, water courses or the soil. Dispose of as hazardous waste in compliance with local and national regulations.

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Contaminated packaging - Contaminated product, soil, water, container residues and spill cleanup materials may be hazardous wastes. Comply with applicable local, state or international regulations concerning solid or hazardous waste disposal and/or container disposal.

SECTION 14: Transport Information

US Department of Transportation Classification (49CFR)

UN number	This substance is not regulated for transport under DOT
UN proper shipping name	Not applicable
Transport hazard class(es)	Not applicable
Packing group, if necessary	Not applicable

IMDG (Transport by sea)

UN number	This substance is not regulated for transport under IMDG
UN proper shipping name	Not applicable
Transport hazard class(es)	Not applicable
Packing group, if necessary	Not applicable

IATA (Country variations may apply)

UN number	This substance is not regulated for transport under IATA
UN proper shipping name	Not applicable
Transport hazard class(es)	Not applicable
Packing group, if necessary	Not applicable

Environmental hazards

Marine pollutant: No.

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

No further relevant information available.

Special precautions which a user needs to be aware of, or needs to comply with, in connection with transport or conveyance either within or outside their premises.

None.

SECTION 15: Regulatory Information

USA:

United States Federal Regulations: This SDS complies with the OSHA, 29 CFR 1910.1200. This product is hazardous under OSHA.

Toxic Substances Control Act (TSCA) – This substance is not listed on the TSCA 12(b) inventory.

CERCLA Hazardous Substance List, 40 CFR 302.4: Not listed.

Section 302 Extremely Hazardous Substance (40 CFR 355, Appendix A): Not listed

SARA HAZARD DESIGNATION SECTIONS 311/312 (40 CFR 370):

Acute Health Hazard	YES
Chronic Health Hazard	NO
Fire Hazard	NO
Reactivity Hazard	NO
Sudden Release of Pressure Hazard	NO

Section 313 Toxic Chemicals (40 CFR 372.65): Not listed

STATE REGULATIONS:

This SDS contains specific health and safety data is applicable for state requirements. For details on your regulatory requirements you should contact the appropriate agency in your state.

California Proposition 65 (California Safe Drinking Water and Toxic Enforcement Act of 1986:
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

Massachusetts Right to Know: This product is not listed on the Massachusetts Right to Know List.

New Jersey Right to Know: 1,3-Butylene glycol (as (R)-(-)-Butane-1,3-diol) is listed on the New Jersey Right to Know list.

Pennsylvania Right to Know: 1,3-Butylene glycol (as (R)-(-)-Butane-1,3-diol) is listed on the Pennsylvania Right to Know List.

SECTION 16: Other Information

Revision Date: Feb 10, 2016

NFPA Rating
Health hazard: 0
Fire Hazard: 1
Reactivity Hazard: 0

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