Section 1 – Product and Company Identification

1.1	**GHS Product Identifier**	:	1,2 Butadiene
	Other means of identification	:	Buta-1,2-diene
	Product Number	:	315188
	Chemical Formula	:	C_4H_6
	CAS Number	:	590-19-2
	EC Number	:	209-674-2
1.2	**Recommended use**	:	Laboratory chemicals, Manufacture of substances
1.3	**Supplier's detail**	:	Wiley Companies 1245 South 6th Street Coshocton, Ohio 43812. (740) 622-0755.
1.4	**Emergency Telephone number**	:	(800) 633-8253.
	International number	:	(801) 629-0667.

Section 2 – Hazards Identification

2.1 GHS Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Flammable gases (Category 1)
Gases under pressure (Liquefied gas)
Acute toxicity, Inhalation (Category 4)

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word **Danger**

Hazard statement(s)

H220	Extremely flammable gas.
H280	Contains gas under pressure; may explode if heated.
H332	Harmful if inhaled.

Precautionary statement(s)

P261	Avoid breathing dust/fume/gas/mist/vapours/spray.
P271	Use only outdoors or in a well-ventilated area
P304 + P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P312	Call a POISON CENTER or doctor/physician if you feel unwell.
P377	Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381	Eliminate all ignition sources if safe to do so.
P410 + P403	Protect from sunlight. Store in a well-ventilated place

2.3 Hazards not otherwise classified or not covered by GHS
Suffocation hazard

Section 3 - Composition / Information on Ingredients

Substance/Mixture

Chemical name	: 1,2 Butadiene
Synonyms	: Buta-1,2-diene
Formula	: C_4H_6
CAS number	: 590-19-2
EC number	: 209-674-2

Hazardous components

Component	Classification	Concentration
1,2 Butadiene	Flammable Gas (Category 1) Pressurized Gas (Liquefied Gas) Acute Toxicity (Category 4)	>98%

Section 4 - First Aid Measures

4.1 Description of necessary first aid measures

If inhaled
Remove person to fresh air. Consult a physician if necessary. If breathing is stopped, administer artificial respiration if trained to do so.

In case of skin contact
Flush with copious amounts of water for at least 15 minutes. Consult a physician if necessary.

In case of eye contact
Flush with copious amounts of water for at least 15 minutes. Consult a physician if necessary.

If ingested
Do NOT induce vomiting. Rinse mouth out with water. Never give liquid to an unconscious person. Consult a physician if necessary.

4.2 Most important symptoms and effects, both acute and delayed
Asphyxiation, CNS depressant.

4.3 Indication of immediate medical attention and special treatment needed, if necessary
Treatment of serious cases would involve support of respiratory function.

Section 5 – Fire Fighting Measure

5.1 Extinguishing media
Suitable extinguishing media
Water spray, alcohol resistant foam, carbon dioxide, dry chemical.

Unsuitable extinguishing media
None.

5.2 Specific hazards arising from the chemical
Carbon oxides.

5.3 Special protective equipment for fire fighters
Cool vessels and containers with sprayed water. As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH for firefighters (approved or equivalent) and full protective gear.

5.4 Special precautions for fire fighters
Containers may explode when heated. Vapours can accumulate in low areas. Evacuate all personnel from the danger area. Remove ignition sources if safe to do so. Vapors can be ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equipment, static discharge, or other ignition sources at locations distant from product release point.

Section 6 – Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures.
Use personal protective equipment. Wear self-contained breathing apparatus when entering area unless atmosphere is proven to be safe. Avoid breathing vapours, mist or gas. Prevent further leakage or spillage if safe to do so. Ensure adequate ventilation, especially in confined areas. Remove all sources of ignition. Evacuate personnel to safe

areas. Prevent contamination of soil, drains and surface water. Take up residue with absorbent material and dispose of in accordance with all local, state and federal regulations.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Prevent entry into waterways, sewers, basements or confined areas.

6.3 Methods and materials for containment and cleaning up

Utilize non-sparking tools. Collect with an electrically protected vacuum cleaner.

Section 7 – Handling and Storage

7.1 Precautions for safe handling

Wear all appropriate personal protective equipment. Avoid contact with skin, eyes and clothing. Avoid vapour inhalation. Ensure good ventilation and local exhaust extraction in work place. Keep away from source of ignition. Use only non-sparking tools. Use only explosion-proof equipment. Take measures to prevent buildup of electrostatic charge. Keep containers tightly closed when not in use.

7.2 Conditions for safe storage, including any incompatibilities

Store material in D.O.T. approved containers. Follow all applicable local, state, and federal regulations. Store in a cool, dry, well-ventilated place, in securely closed original container.

Section 8 – Exposure Controls / Personal Protection

8.1 Control parameters

Occupational exposure limits

Contains no substances with occupational exposure limit values.

8.2 Appropriate engineering controls

Engineering Controls:

Make emergency eyewash stations, safety/quick-drench showers, and washing facilities available in work area. Provide general or local exhaust ventilation systems to maintain airborne concentrations below OSHA PELs.

8.3 Individual protection measures

Administrative Controls:

Handle in accordance with good industrial hygiene and safety practice. When workplace conditions warrant respirator use, follow a respiratory protection program that meets OSHA 29 CFR 1910.134, ANSI Z88.2, or MSHA 30 CFR 72.710 (where applicable). Use an air-supplied or air-purifying cartridge if the action level is exceeded. Ensure that the respirator has the appropriate protection factor for the exposure level. If cartridge type respirators are

used, the cartridge must be appropriate for the chemical exposure (e.g., an organic vapor cartridge). For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus (SCBA).

Wear protective eyeglasses or chemical safety goggles, per OSHA eye and face protection regulations (29 CFR 1910.133). Wear face shield and safety glasses as approved under appropriate government standards (NIOSH or EN 166).Wear chemically protective gloves. Wear flame retardant protective clothing.

Section 9 – Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

Appearance	:	Liquefied gas.
Odour	:	No data available.
Odour Threshold	:	No data available.
pH	:	No data available.
Melting point/freezing point	:	-136.2 °C (-213.2 °F)
Initial boiling point and boiling point range	:	10.9 °C, (51.6 °F)
Flash point	:	No data available.
Evaporation rate	:	No data available.
Flammability (solid, gas)	:	No data available.
Upper/lower flammability Or explosive limits	:	Upper explosion limit: 12 %(V) Lower explosion limit: 2 %(V)
Vapour pressure	:	1260 mm Hg @ 25 °C
Vapour density	:	1.9 (Air=1)
Relative density	:	0.68 g/cm3 at 0 °C (32 °F)
Water solubility	:	Insoluble in water
Partition coefficient: n-octanol/water	:	log Pow: 1.99 at 25 °C (77 °F)
Auto-ignition Temperature	:	340 °C (644 °F)
Decomposition Temperature	:	No data available.
Viscosity	:	No data available.

Molecular weight : 54.09 g/mol

Section 10 – Stability and Reactivity

10.1 Reactivity
Reacts rapidly with ozone under standard laboratory conditions (-78 °C in methanol) to produce carbon monoxide, acetaldehyde, some peroxidic compounds, and acetic acid.

10.2 Chemical stability
This material is stable at room temperature in closed containers under normal storage and handling conditions.

10.3 Possibility of hazardous reactions
Vapours may form explosive mixture in air.

10.4 Conditions to avoid
Heat, flames and other sources of ignition. Take measures to prevent buildup of electrostatic charge.

10.5 Incompatible materials
Strong oxidizing agents.

10.6 Hazardous decomposition products
When heated to decomposition it emits acrid smoke and fumes.
Carbon oxides.

Section 11 – Toxicological Information

11.1 Information on toxicological effects

Acute toxicity
LC50 Inhalation - Rat - male and female - 4 h - 8000 ppm

Skin corrosion/irritation
No data available.

Serious eye damage/eye irritation
No data available.

Respiratory or skin sensitization
No data available.

Germ cell mutagenicity

No data available.

Carcinogenicity

ARC : 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.

ACGIH : No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

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.

OSHA : No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available.

Specific target organ toxicity – single exposure
No data available.

Specific target organ toxicity – repeated exposure
No data available.

Aspiration hazard
No data available.

Information on the likely routes of exposure
Inhalation, Skin and eye contact.

Symptoms related to the physical, chemical and toxicological characteristics
CNS depression, dizziness, irritation.

Delayed and immediate effects and also chronic effects from short and long-term exposure
No data available.

Numeric measures of toxicity
No data available.

Section 12 – Ecological Information

12.1 Toxicity

No data available.

12.2 Persistence and degradability
No data available.

12.3 Bioaccumulative potential
No data available.

12.4 Mobility in soil
Expected to have very high mobility in soil.

12.5 Other adverse effects
No data available.

Section 13 – Disposal Considerations

13.1 Disposal Methods
Follow all applicable local, state, and federal regulations.
Dispose of contents/container in accordance with local/regional/national/international regulations.

Section 14 – Transport Information

	DOT	IMDG	IATA
UN number	UN1010	UN1010	UN1010
Un proper shipping name	UN1010, Butadienes, stabilized	UN1010, BUTADIENES, STABILIZED	UN1010, Butadienes, stabilized
Transport hazard class	2.1	2.1	2.1
Packing group	-	-	-
Marine pollutant	No	No	-

Section 15 – Regulatory Information

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
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.

SARA 311/312 Hazards
Fire hazard.

Section 16 – Other Information

	HMIS		NFPA
Health - Chronic			
Health Hazard	0	Health Hazard	0
Flammability	4	Fire Hazard	4
Physical	3	Reactivity	0

Prepared By:
Wiley Companies.

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