Product Stewardship Summary

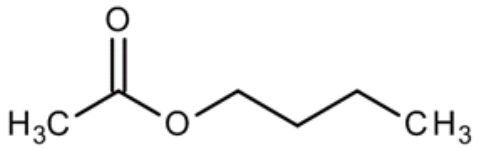
N-butyl acetate

General Statement

N-butyl acetate is a chemical with consumer and industrial uses, ranging from cleaning and painting products to serving as an intermediate in chemical formulations and acting as a plating and surface-treating agent. N-butyl acetate is a low hazard material and risk of adverse health effects associated with both occupational and consumer use of this chemical is anticipated to be low.

Chemical Identity

Name: N-butyl acetate
Brand Names: Not applicable
Chemical name (IUPAC): 1-Butyl acetate
CAS number(s): 123-86-4
EC number: 204-658-1
Molecular formula: $C_6H_{12}O_2$
Structure:



Uses and Applications

N-butyl acetate is mainly used as a solvent and a thinner in the production of nitrocellulose lacquers in the protective coatings industry. It is also used in the manufacturing of high-polish lacquers and varnishes, photographic film, nail polish removers, perfumes, oils, fats, vinyl resins, waxes, and camphor. N-butyl acetate is also used in the preservation of foodstuffs and in the inks and thinners of printing processes.

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Physical/Chemical Properties

Phys/Chem Safety Assessment

Property	Value
Form	Substance
Physical state	Liquid
Color	Colorless
Odor	Banana-like odor
Density	0.8825 g/cm^3 @ 20°C
Melting / boiling point	-78°C / 126°C
Flammability	No data available
Explosive properties	No data available
Self-ignition temperature	425°C
Vapor pressure	1.2 kPa @ 20°C
Mol weight	116.15 g/mol
Water solubility	14 g/L @ 20°C; 5 g/L @25°C
Flash point	22°C (closed cup)
Octanol-water partition coefficient (Logk_{ow})	1.8

Exposure, Hazard and Safety Assessment

The following section describes possible exposures scenarios and hazards associated with n-butyl acetate. The exposure assessment describes both the amount of and the frequency with which a chemical substance reaches a person, a population of people, or the environment. Hazard refers to the inherent properties of a substance that make it capable of causing harm to human health or the environment. The safety assessment reports the possibility of a harmful event arising from exposure to a chemical or physical agent under specific conditions. Just because a substance may possess potentially harmful properties does not mean that it automatically poses a risk. It is not possible to make that determination without understanding the exposure.

Human Health Effects

Human Exposure Assessment

Consumer: N-butyl acetate is used as a solvent in liquid formulation products, typically lacquers, solvent mixtures, inks, coatings, and adhesives. Application of these materials could result in consumer exposure via the dermal and inhalation routes.

Worker: In industrial settings, n-butyl acetate is manufactured and handled in closed processes as much as possible, which ensures that worker exposure to n-butyl acetate is minimized. The proper use of personal protective equipment during loading, unloading, sampling or during maintenance operations, will further minimize potential exposures to n-butyl acetate.

Human Hazard Assessment

N-butyl acetate has low potential to elicit both acute and repeat dose toxicity; however, inhalation of high doses can cause transient reversible sedation. N-butyl acetate is neither genotoxic nor mutagenic and is not associated with carcinogenicity or reproductive toxicity. N-butyl acetate has resulted in mild developmental toxicity in rat inhalation studies when exposure was predicated on high doses.

Effect Assessment	Result
Acute Toxicity Oral / inhalation / dermal	Low toxicity based on oral, dermal and inhalation exposures. Aspiration into the lungs may occur during ingestion or vomiting, causing lung damage or even death due to chemical pneumonia.
Irritation / corrosion Skin / eye / respiratory test	Not a dermal sensitizer or an eye or skin irritant.
Toxicity after repeated exposure Oral / inhalation / dermal	Does not cause significant toxicity to internal organs after repeated exposure in animal studies by any exposure route. Transient reversible sedation during exposure.
Genotoxicity / Mutagenicity	Neither mutagenic or genotoxic.
Carcinogenicity	No carcinogenic effects expected.
Toxicity for reproduction	No adverse effect on reproduction. May result in developmental toxicity at high doses.

Human Health Safety Assessment

Consumer: Use of consumer products containing n-butyl acetate could result in consumer exposure via the dermal and inhalation routes. Exposures to appreciable concentrations are not anticipated during use of consumer products. Based on exposure to anticipated low concentrations and the low toxicity associated with n-butyl acetate, consumer risk is unlikely.

Worker: In industrial settings, n-butyl acetate is manufactured and handled primarily in closed processes which limit exposure. Based on good manufacturing processes and industrial hygiene, the occupational health risk associated with n-butyl acetate is low.

Environmental Effects

Environmental Exposures

N-butyl acetate is readily biodegradable and has low potential for bioaccumulation. N-butyl acetate is not persistent in the environment and is not likely to bioaccumulate in food webs. Based on its physical and chemical properties, n-butyl acetate has a high water solubility, is expected to have high mobility in soil and will not adsorb to suspended solids and sediment in the aquatic environment. Volatilization from water surfaces is expected to be an important fate and transport process.

Environmental Hazard Assessment

Effect Assessment	Result
Aquatic Toxicity	Moderate acute toxicity to fish and aquatic invertebrates.

Fate and behavior	Result
Biodegradation	Readily biodegradable.
Bioaccumulation potential	Not potentially bioaccumulative (log K_{ow} = 1.8).
PBT / vPvB conclusion	Not considered to be either PBT or vPvB.

Environmental Safety Assessment

Based on the available data, n-butyl acetate is considered moderately toxic to fish and aquatic invertebrates following acute exposures. It is readily biodegradable and has a low potential for bioaccumulation.

Risk Management Recommendations

Exposure to n-butyl acetate in the workplace can be controlled by sufficient ventilation, proper handling and storage techniques, and the use of appropriate personal protective equipment as recommended in the SDS. Consumer products that contain significant levels of n-butyl acetate within the product formulation should include appropriate safety labeling and provide appropriate handling and disposal methods.

A selection of occupational exposure limits are provided below:

- ACGIH TLV (8hr-TWA) 150ppm Upper respiratory tract irritation, eye irritation
- ACGIH TLV (1hr-STEL) 200ppm Upper respiratory tract irritation, eye irritation
- OSHA OEL (8hr-TWA) 150ppm (710mg/m^3)
- NIOSH REL (8hr-TWA) 150ppm (710 mg/m^3)
- NIOSH REL (1hr-ST) 200ppm (950 mg/m^3)

Regulatory Agency Review

N-butyl acetate is on the following lists:

ACGIH - Threshold Limit Values (TLVs)
AIHA - Emergency Response Planning Guidelines (ERPGs)
AIHA - Emergency Response Planning Guidelines (ERPGs) - Under Review
Alberta - Occupational Exposure Limits (OELs)
Argentina - Occupational Exposure Limits (OELs)
Arizona DOSH - Exposure Limits for Air Contaminants - Table Z-1
ATSDR - 2015 Priority List of Hazardous Substances - Exposure Points
ATSDR - 2015 Priority List of Hazardous Substances - Frequency Points
ATSDR - 2015 Priority List of Hazardous Substances - Rank and Summary
ATSDR - 2015 Priority List of Hazardous Substances - Source Contribution Points
ATSDR - 2015 Priority List of Hazardous Substances - Toxicity Points
ATSDR - Completed Exposure Pathway (CEP) Cumulative Site Count Report
Australia - Workplace Exposure Standards
Australian Inventory of Chemical Substances (AICS)
Belgium - Occupational Exposure Limits (OELs)
British Columbia - Occupational Exposure Limits (OELs)
Bulgaria - Occupational Exposure Limits (OELs)
Cal/OSHA - Permissible Exposure Limits for Chemical Contaminants
Cal/OSHA - The Hazardous Substances List
China - Chemical Inventory of Existing Chemical Substances (IECSC) - CAS Numbers
Colombia - Occupational Exposure Limits (OELs)
Connecticut OSHA - Exposure Limits for Air Contaminants - Table Z-1
Denmark - Occupational Exposure Limits (OELs)
DOE Protective Action Criteria (PAC)
ECHA - List of Pre-registered Substances
Environment Canada - Domestic Substances List (DSL)
Environment Canada - Domestic Substances List (DSL) - Persistent Categorization
Environment Canada - Domestic Substances List (DSL) Categorization of Existing Substances
Environment Canada - Hazardous Products Act (HPA) - Ingredient Disclosure List (IDL)
Environment Canada - National Pollutant Release Inventory (NPRI) – 2003-2014/15
EPA - Acute Exposure Guideline Levels (AEGLs) - Priority List 2
EPA - CERCLA - Hazardous Substances and their Reportable Quantities (RQs)
EPA - Chemical Update System (CUS) - 2002
EPA - Clean Air Act - Section 111 - Standards of Performance for New Stationary Sources of Air Pollutants
EPA - Clean Water Act - Section 304B - Effluent Limitation Guidelines
EPA - Clean Water Act - Section 311 - List of Hazardous Substances

EPA - Fragrance Ingredient List
EPA - Inert Ingredients - Fragrance Use
EPA - Inert Ingredients in Pesticide Products
EPA - Inert Ingredients Permitted for Use in Nonfood Pesticide Products
EPA - Master Testing List
EPA - Master Testing List (1996)
EPA - Office of Pollution Prevention and Toxics (OPPT) High Production Volume (HPV) Program - 1990
EPA - SARA - Section 110 - Priority List of Hazardous Substances
EPA - TSCA - 12(b) - Export Notification
EPA - TSCA - Inventory
EPA - TSCA - Test Submissions - Mega
EPA - TSCA - Test Submissions - Section 4
EPA - TSCA 4 Tests - Testing of Existing Chemicals
EPA - TSCA Section 4 Testing Results
EU - Approved Flavoring Substances
EU - Cosmetic Ingredients and Fragrance Inventory
EU - European Inventory of Existing Commercial Substances (EINECS)
EU - Table 3.1 of Annex VI to the CLP Regulation
EU - Table 3.2 of Annex VI to the CLP Regulation
FDA - Everything Added to Food In The United States (EAFUS)
Finland - Occupational Exposure Limits (OELs)
France - Occupational Exposure Limits (OELs)
Germany - Occupational Exposure Limits (OELs)
Hawaii - Department of Labor and Industrial Relations - Air Contaminants - Permissible Exposure Limits
Hawaii - State Department of Health - Reportable Quantities
Hungary - Occupational Exposure Limits (OELs)
Iceland - Occupational Exposure Limits (OELs)
ICH Harmonized Tripartite Guideline - Q3C(R5) - Class 3 Solvents
Indiana OSHA - Exposure Limits for Air Contaminants - Table Z-1
International Conference on Harmonization (ICH) - Q3C - Tables and List
International Council of Chemical Associations (ICCA) - High Production Volume (HPV) Initiative
International Council of Chemical Associations (ICCA) - High Production Volume (HPV) Initiative Completed Summaries
Iowa OSHA - Exposure Limits for Air Contaminants - Table Z-1
Japan - Occupational Exposure Limits (OELs)
Jordan - Occupational Exposure Limits (OELs)
Korea - Occupational Exposure Limits (OELs)
Maryland OSH - Exposure Limits for Air Contaminants - Table Z-1
Massachusetts Department of Public Health - Massachusetts Substance List (MSL)
Massachusetts Toxics Use Reduction Act (TURA)
Mexico - National Inventory of Chemical Substances
Mexico - Occupational Exposure Limits (OELs)
Michigan - Exposure Limits for Air Contaminants - Table G-1-A
Mine Safety and Health Administration (MSHA) - Permissible Exposure Limits (PELs)
Minnesota - Department of Labor and Industry - Air Contaminants - Permissible Exposure Limits
Minnesota - List of Hazardous Substances
National Cancer Institute - SMILES Notations
Nevada OSHA - Exposure Limits for Air Contaminants - Table Z-1
New Jersey - Right to Know List
New Mexico OHSB - Exposure Limits for Air Contaminants - Table Z-1
New Zealand - Inventory of Chemicals (NZIoC)
New Zealand - Workplace Exposure Standards
NFPA - Hazard Ratings
NIOSH - Immediately Dangerous to Life or Health (IDLH) Concentration Values
NIOSH - Pocket Guide - Chemicals Listed
NIOSH - Recommendations for Chemical Protective Clothing
NIOSH - Recommended Exposure Limits (RELs)
NOAA Screening Quick Reference Tables - Organic in Water and Soil
NOAA Screening Quick Reference Tables - Organics - Sediment
Norway - Occupational Exposure Limits (OELs)
OECD - High Production Volume (HPV) Chemicals - 2004

OECD - High Production Volume (HPV) Chemicals - 2007
Ontario - Current Occupational Exposure Limits (OELs)
OSHA - 29 CFR 1910.1000 - Table Z-1
OSHA - 29 CFR 1910.1000 - Table Z-1 - Annotated
OSHA - Permissible Exposure Limits (PELs) - Construction
OSHA - Permissible Exposure Limits (PELs) - Federal Contractors
OSHA - Permissible Exposure Limits (PELs) - Shipyards
OSHA - Vacated Permissible Exposure Limits (PELs)
Pennsylvania - Hazardous Substance List
People's Republic of China - Second Category of Chemicals Subject to the Environmental Management on the First Import of Chemicals
Peru - Occupational Exposure Limits (OELs)
Philippine Inventory of Chemicals and Chemical Substances (PICCS)
Poland - Occupational Exposure Limits (OELs)
Puerto Rico OSHA - Exposure Limits for Air Contaminants - Table Z-1
Rhode Island - Hazardous Substance List
Russia - Occupational Exposure Limits (OELs)
Singapore - Occupational Exposure Limits (OELs)
South Carolina OSH - Exposure Limits for Air Contaminants - Table Z-1
Sweden - Occupational Exposure Limits (OELs)
Switzerland - Occupational Exposure Limits (OELs)
Technischen Regeln für Gefahrstoffe (TRGS) - TRGS900
Tennessee OSHA - Exposure Limits for Air Contaminants - Table Z-1
TETRATOX - Toxicity and Chemical Descriptor Data for 500 Aliphatic Chemicals
The Netherlands - Occupational Exposure Limits (OELs)
The Philippines - Occupational Exposure Limits (OELs)
Turkey - Occupational Exposure Limits (OELs)
United Kingdom - Occupational Exposure Limits (OELs)
United Kingdom - Workplace Exposure Limits (WELs) - 2011
Utah OSH - Exposure Limits for Air Contaminants - Table Z-1
Vermont - Department of Labor - Air Contaminants - Permissible Exposure Limits
Vietnam - Occupational Exposure Limits (OELs)
Virgin Islands DOSH - Exposure Limits for Air Contaminants - Table Z-1
Virginia OSH - Exposure Limits for Air Contaminants - Table Z-1
Washington State - Permissible Exposure Limits (PELs) for Airborne Contaminants
Wyoming OSHA - Exposure Limits for Air Contaminants - Table Z-1

Regulatory Information / Classification and Labeling

Under the Globally Harmonized System for classification and labeling (GHS), substances are classified according to their physical, health, and environmental hazards. The hazards are communicated via specific labels and the (Extended) SDS. GHS attempts to standardize hazard communication so that the intended audience (workers, consumers, transport workers, and emergency responders) can better understand the hazards of the chemicals in use.

GHS Classification:

Flammable Liquid, Category 3
Specific Target Organ Toxicity - Single Exposure (STOT-SE), Category 3

Hazard Statements:

H226: Flammable liquid and vapor
H336: May cause drowsiness or dizziness

Signal Word: Warning

Precautionary Statements:

P210: Keep away from heat/sparks/open flames/hot surfaces - No smoking.
P235: Keep cool.
P223: Keep container tightly closed.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P261: Avoid breathing dust/fume/gas/mist/vapors/spray.
P312: Call a POISON CENTER or doctor/physician if you feel unwell.
P304: IF INHALED: remove victim to fresh air and keep at rest in a position comfortable for breathing.
P303: IF ON SKIN (or hair): remove/take off immediately all contaminated clothing. Rinse skin with water/shower.

Hazard Pictograms:

Conclusion

N-butyl acetate is a useful chemical solvent in liquid formulation products, typically lacquers, solvent mixtures, inks, coatings, and adhesives. When handled responsibly, the potential for exposure can be minimized, allowing consumers and workers to use materials containing n-butyl acetate safely.

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Additional Information

For more information on GHS, visit http://www.osha.gov/dsg/hazcom/ghsguideoct05.pdf or http://live.unece.org/trans/danger/publi/ghs/ghs_welcome_e.html.
Ashland product stewardship summaries are located at http://www.ashland.com/sustainability/product/product-stewardship

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REACH registration is specific to Importers/Manufacturers that place the chemical on the EU market, and is specific to registered uses. Inclusion on the list of REACH Registered Substances does not automatically imply registration by Ashland.

Inclusion on the New Zealand Inventory of Chemicals applies only to the pure substance listed. The importer of record must determine whether or not their substances are in compliance.