Material Safety Data Sheet
2,3-Butanedione, 99%

ACC# 03275

Section 1 - Chemical Product and Company Identification

MSDS Name: 2,3-Butanedione, 99%
Catalog Numbers: AC107650000, AC107650050, AC107651000, AC107655000
Synonyms: Diacetyl; 2,3-Diketobutane; Dimethyl diketone; Dimethylglyoxal; Biacetyl.
Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01
For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
431-03-8	2,3-Butanedione	99	207-069-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellow to green liquid. Flash Point: 6 deg C.
Warning! Flammable liquid and vapor. Causes eye, skin, and respiratory tract irritation. Harmful if inhaled or swallowed. May cause central nervous system depression. May cause lung damage. Marine pollutant.
Target Organs: Lungs, respiratory system, eyes, skin.

Potential Health Effects
Eye: Causes eye irritation. Causes redness and pain. May cause chemical conjunctivitis and corneal damage. Vision may become blurred.
Skin: Causes moderate skin irritation. Causes redness and pain. May be harmful if absorbed through the skin.
Ingestion: Harmful if swallowed. May cause gastrointestinal irritation with nausea, vomiting and diarrhea. Ingestion of large amounts may cause CNS depression.
Inhalation: Causes respiratory tract irritation. May cause lung damage. Vapors may cause dizziness or suffocation. Harmful if inhaled. Inhalation of vapors may cause drowsiness and dizziness. High exposure to butanedione may cause headache, drowsiness, lack of coordination and seizures. May cause a feeling of tightness in the chest.
Chronic: Chronic exposure may cause lung damage. Repeated exposure may damage the red blood cells causing anemia.2,3-Butanedione has been linked to bronchiolitis obliterans, a disease characterized by inflammation and scarring in the smallest airways of the lungs, which leads to severe and disabling shortness of breath.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid imme diately.
Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.
Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.
Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.
Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Vapors may form an explosive mixture with air. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Containers may explode in the heat of a fire. Flammable liquid and vapor. Vapors are heavier than air and may travel to a source of ignition and flash back. Vapors can spread along the ground and collect in low or confined areas. Hazardous polymerization may occur under fire conditions.
Extinguishing Media: Water may be ineffective. Water may spread fire. If water is the only media available, use in flooding amounts. Do NOT use straight streams of water. Use water fog, dry chemical, carbon dioxide or alcohol type foam.
Flash Point: 6 deg C (42.80 deg F)
Autoignition Temperature: 365 deg C (689.00 deg F)
Explosion Limits, Lower:2.4%
Upper: 13.0%
NFPA Rating: (estimated) Health: 2; Flammability: 3; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Remove all sources of ignition. Use a spark-proof tool. A vapor suppressing foam may be used to reduce vapors.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Avoid contact with eyes, skin, and clothing. Do not breathe dust, vapor, mist, or gas. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Keep away from heat, sparks and flame. Use only with adequate ventilation or respiratory protection.
Storage: Keep away from sources of ignition. Store in a tightly closed container. Refrigerator/flammables.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
2,3-Butanedione	none listed	none listed	none listed

OSHA Vacated PELs: 2,3-Butanedione: No OSHA Vacated PELs are listed for this chemical.
Personal Protective Equipment
Eyes: Wear chemical splash goggles.
Skin: Wear appropriate protective gloves to prevent skin exposure.
Clothing: Wear appropriate protective clothing to prevent skin exposure.
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 exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Liquid
Appearance: yellow to green
Odor: strong rancid - chlorine-like - butter-like
pH: Not available.
Vapor Pressure: 39 mm Hg @ 20 deg C
Vapor Density: 3 (air=1)
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: 88 deg C @ 760 mm Hg
Freezing/Melting Point:-4 deg C
Decomposition Temperature:> 110 deg C
Solubility: Soluble.
Specific Gravity/Density:.9850
Molecular Formula:C4H6O2
Molecular Weight:86.09

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Material is heat sensitive and may decompose at elevated temperatures.
Conditions to Avoid: Light, ignition sources, excess heat.
Incompatibilities with Other Materials: Metals, oxidizing agents, reducing agents, acids, strong bases.
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.
Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:
CAS# 431-03-8: EK2625000
LD50/LC50:
CAS# 431-03-8:
Draize test, rabbit, skin: 500 mg/24H Moderate;
Oral, rat: LD50 = 1580 mg/kg;
Oral, rat: LD50 = 3000 mg/kg;
Skin, rabbit: LD50 = >5 gm/kg;
.

Carcinogenicity:
CAS# 431-03-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: 2,3-Butanedione has been associated with lung disease, bronchiolitis obliterans, in workers at a microwave-popcorn

plant. Lung damage was so severe a double lung transplant is needed in one of those afflicted.
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: Mutagenic effects have occurred in experimental animals.
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.
Environmental: Biodegradable.
Physical: No information available.
Other: Marine pollutant.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	BUTANEDIONE	FLAMMABLE LIQUID, TOXIC, N.O.S. (Butanedione)
Hazard Class:	3	3
UN Number:	UN2346	UN1992
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA
CAS# 431-03-8 is listed on the TSCA inventory.
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.
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.
CERCLA Hazardous Substances and corresponding RQs
None of the chemicals in this material have an RQ.
SARA Section 302 Extremely Hazardous Substances
None of the chemicals in this product have a TPQ.
SARA Codes
CAS # 431-03-8: immediate, fire.
Section 313 No chemicals are reportable under Section 313.
Clean Air Act:
This material does not contain any hazardous air pollutants.
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.
Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances 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.
STATE
CAS# 431-03-8 can be found on the following state right to know lists: New Jersey, Pennsylvania, Massachusetts.

California Prop 65

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

European/International Regulations
European Labeling in Accordance with EC Directives
Hazard Symbols:
XN F
Risk Phrases:
R 11 Highly flammable.
R 20/22 Harmful by inhalation and if swallowed.
R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 16 Keep away from sources of ignition - No smoking.
S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S 33 Take precautionary measures against static discharges.
S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 431-03-8: 1

Canada - DSL/NDSL

CAS# 431-03-8 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B2, D2B.

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

Canadian Ingredient Disclosure List

CAS# 431-03-8 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 1/23/1998
Revision #7 Date: 5/14/2004