

| | | |
|--|--|---|
|  208 South Magnolia Street Sumter, SC 29150 Customer Service 803-778-0264 | SAFETY DATA SHEET Nova Molecular Technologies, Inc. | |
| | Methyl Ethyl Ketone | Revision Date/Date Issued: 4/20/2020 |
| | | Version 1.1 |


1. PRODUCT and COMPANY IDENTIFICATION

| | |
|---|---|
| PRODUCT NAME: Methyl ethyl ketone | 24 HR. EMERGENCY TELEPHONE NUMBERS |
| GENERAL USE: Industrial use, Manufacture of substances | Emergency Phone: 803-778-0264 |
| GENERIC NAME: MEK, Methyl ethyl ketone, 2-Butanone | For emergency, spill, leak, fire, exposure or accident, call: CHEMTREC: 1-800-424-9300 Outside of the United States, call: 703-527-3887 (collect calls accepted) |
| DISTRIBUTOR: | |
| Nova Molecular Technologies, Inc. | |
| 208 South Magnolia Street Sumter, SC 29150 | |

2. HAZARDS IDENTIFICATION

GHS CLASSIFICATION

| Classification of the substance or mixture | GHS Classification in accordance with 29 CFR 1910 (OSHA HCS) |
|---|--|
| Flammable liquids (Category 2), H225 | |
| Eye irritation (Category 2A), H319 | |
| Specific target organ toxicity - single exposure (Category 3), Central nervous system, H336 | |
| For the full text of the H-Statements mentioned in this Section, see Section 16. | |

| GHS LABEL |  |
|-----------------------------------|--|
| SIGNAL WORD: | Danger |
| HAZARD STATEMENTS | |
| H225 | Highly flammable liquid and vapor. |
| H319 | Causes serious eye irritation. |
| H336 | May cause drowsiness or dizziness. |
| Precautionary statement(s) | |
| P210 | Keep away from heat/sparks/open flames/hot surfaces. - No smoking. |
| P233 | Keep container tightly closed. |
| P240 | Ground/bond container and receiving equipment. |
| P241 | Use explosion-proof electrical/ ventilating/ lighting/ equipment. |
| P242 | Use only non-sparking tools. |
| P243 | Take precautionary measures against static discharge. |
| P261 | Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray. |
| P264 | Wash skin thoroughly after handling. |
| P271 | Use only outdoors or in a well-ventilated area. |
| P280 | Wear protective gloves/ eye protection/ face protection. |
| P303 + P361 + P353 | IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower. |
| P304 + P340 + P312 | IF INHALED: Remove victim to fresh air and keep at rest in a position |

| | |
|--------------------|---|
| | comfortable for breathing. Call a POISON CENTER or doctor/ physician if you feel unwell. |
| P305 + P351 + P338 | IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/ physician. |
| P337 + P313 | If eye irritation persists: Get medical advice/ attention. |
| P370 + P378 | In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction. |
| P403 + P233 | Store in a well-ventilated place. Keep container tightly closed. |
| P403 + P235 | Store in a well-ventilated place. Keep cool. |
| P405 | Store locked up. |
| P501 | Dispose of contents/ container to an approved waste disposal plant. |

3. COMPOSITION / INFORMATION ON INGREDIENTS

| Chemical Name | Wt. % | CAS |
|-------------------|-------|---------|
| 2-Butanone | 100 % | 78-93-3 |

4. FIRST AID MEASURES

| | |
|---|---|
| General Advice | Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area |
| EYES: | Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician. |
| SKIN: | Wash off with soap and plenty of water. Consult a physician. |
| INGESTION: | Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician. |
| INHALATION: | If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician. |
| Most important symptoms and effects, both acute and delayed | The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11 |
| Indication of any immediate medical attention and special treatment needed | No data available |

5. FIRE FIGHTING MEASURES

| | |
|--|---|
| Extinguishing media | |
| Suitable extinguishing media | Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. |
| Special hazards arising from the substance or mixture | Carbon oxides Flash back possible over considerable distance. Container explosion may occur under fire conditions. |
| Advice for firefighters | Wear self-contained breathing apparatus for firefighting if necessary. |
| Further information | Use water spray to cool unopened containers. |

6. ACCIDENTAL RELEASE MEASURES

| | |
|---|---|
| Personal precautions, protective equipment and emergency procedures | Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas. For personal protection see section 8. |
| Environmental precautions | Prevent further leakage or spillage if safe to do so. Do not let product enter drains. |
| Methods and materials for containment and cleaning up | Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13). |
| Reference to other sections | For disposal see section 13. |
| SPECIAL PROTECTIVE EQUIPMENT: EMERGENCY & NON-EMERGENCY RESPONDERS | Refer to Section 13 of this SDS for appropriate exposure controls and personal protective equipment (PPE). |

7. HANDLING AND STORAGE

| | |
|----------------------------|--|
| GENERAL PROCEDURES: | Handle in accordance with good industrial hygiene and safety practices. These practices include but are not limited to avoiding unnecessary exposure and prompt removal of material from eyes, skin and clothing. Do not breathe material. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. If needed, take first aid actions as indicated in Section 4 of this SDS. |
| HANDLING: | Use only with adequate ventilation. Wear appropriate personal protective equipment and use exposure controls as indicated in Section 8 of this SDS. Avoid contact with skin and eyes. Avoid breathing gas. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Do not reuse container. Remove contaminated clothing immediately. Wash with soap and water after working with this product. |
| STORAGE: | Keep in airtight container away from all heat sources. Store in a segregated and approved area. Store in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Keep container in a well-ventilated area. Store away from incompatible materials. Store in the original container or an approved alternative made from compatible material. Do not store in unlabeled containers. Treat empty containers in a similar fashion as residual product may exist. Use appropriate containment to avoid environmental contamination. |

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE GUIDELINES

| OSHA HAZARDOUS COMPONENTS (29 CFR1910.1200) | | | | | |
|---|------|-----------------|-------------------|-----------|-------------------|
| | | EXPOSURE LIMITS | | | |
| | | OSHA PEL | | ACGIH TLV | |
| Chemical Name | | ppm | mg/m ³ | ppm | mg/m ³ |
| 2-Butanone | TWA | 200 | 590 | 200 | N/E |
| | STEL | N/E | N/E | 300 | N/E |

| | |
|------------------------------|--|
| ENGINEERING CONTROLS: | Provide adequate general and local exhaust ventilation to meet exposure limit requirements. Provide readily accessible eye wash stations and emergency showers. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances. |
|------------------------------|--|

| PERSONAL PROTECTIVE EQUIPMENT | |
|-------------------------------|--|
| Eye/face protection | Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). |
| Skin protection | Handle with gloves. 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. |
| Splash contact | Splash contact Material: butyl-rubber Minimum layer thickness: 0.3 mm Break through time: 292 min Material tested: Butoject® (KCL 897 / Aldrich Z677647, Size M) |
| 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). |

| | |
|---------------------------------|--|
| WORK HYGIENIC PRACTICES: | Use good personal hygiene practices. Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities. Promptly remove contaminated clothing and launder before reuse. Shower after work using plenty of soap and water. |
|---------------------------------|--|

9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|--|
| a. Appearance | Form: liquid, clear Color: colorless |
| b. Odor | No data available |
| c. Odor Threshold | No data available |
| d. pH | No data available |
| e. Melting point/freezing point | -86.99 °C (-124.58 °F) |
| f. Initial boiling point and boiling range | 80 °C (176 °F) - lit. |
| g. Flash point | -2.99 °C (26.62 °F) - closed cup |
| h. Evaporation rate | No data available |
| i. Flammability (solid, gas) | No data available |
| j. Upper/lower flammability or explosion limits | Upper explosion limit:10.1% (V) Lower explosion limit: 1.8%(V) |
| k. Vapor pressure | 95 hPa (71 mmHg) at 20 °C (68 °F) |
| l. Vapor density | 2.49 - (Air = 1.0) |
| m. Relative density | 0.805 g/mL at 25 °C (77 °F) |
| n. Water solubility | soluble |
| o. Partition coefficient: n-octanol/water | log Pow: 0.29 |
| p. Auto ignition temperature | No data available |
| q. Decomposition temperature | No data available |
| r. Viscosity | No data available |
| s. Explosive properties | No data available |
| t. Oxidizing properties | No data available |
| Other safety information | |
| Surface tension | 24.6 mN/m at 20 °C (68 °F) |
| Relative vapor density | 2.49 - (Air = 1.0) |

10. STABILITY AND REACTIVITY

| | |
|---|---|
| Reactivity | No data available |
| Chemical stability | Stable under recommended storage conditions. |
| Possibility of hazardous reactions | Vapors may form explosive mixture with air. |
| Conditions to avoid | Exposure to moisture, heat, flames and sparks. |
| Incompatible materials | Oxidizing agents, Strong reducing agents |
| Hazardous decomposition products | Other decomposition products - No data available In the event of fire: see section 5 |

| |
|--------------------------------------|
| 11. TOXICOLOGICAL INFORMATION |
|--------------------------------------|

ACUTE

| Chemical Name | ORAL LD50 (rat) | DERMAL LD50 (rabbit) | INHALATION LC50 (rat) |
|-------------------|-----------------------|----------------------------|--------------------------|
| 2-Butanone | 2,737 mg/kg | 6,480 mg/kg | 4 h - 32,000 mg/m3 |

| | |
|---|--|
| Skin corrosion/irritation | Skin - Rabbit Result: No skin irritation (OECD Test Guideline 404) |
| Serious eye damage/eye irritation | Eyes – Rabbit Result: Irritating to eyes. (OECD Test Guideline 405) |
| Respiratory or skin sensitization | No data available |
| Germ cell mutagenicity | No data available |
| Carcinogenicity | <p>This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.</p> <p>IARC: 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.</p> <p>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.</p> <p>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.</p> <p>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.</p> |
| Reproductive toxicity | No data available |
| Specific target organ toxicity - single exposure | May cause drowsiness or dizziness |
| Specific target organ toxicity - repeated exposure | No data available |
| Aspiration hazard | No data available |
| Additional Information | <p>RTECS: EL6475000</p> <p>Central nervous system depression, Gastrointestinal disturbance, narcosis</p> <p>Livers - Irregularities - Based on Human Evidence Livers - Irregularities - Based on Human Evidence</p> |

12. ECOLOGICAL INFORMATION

| | |
|--|---|
| Toxicity | |
| Toxicity to fish | mortality NOEC - Cyprinodon variegatus (sheep head minnow) - 400 mg/l - 96 h LC50 - Pimephales promelas (fathead minnow) - 3,130 - 3,320 mg/l - 96 h |
| Toxicity to daphnia and other aquatic invertebrates | LC50 - Daphnia magna (Water flea) - > 520 mg/l - 48 h |
| Toxicity to algae | No data available |
| Persistence and degradability | No data available |
| Biodegradability | No data available |
| Bio-accumulative potential | No data available |
| Mobility in soil | No data available |
| Results of PBT and vPvB assessment | PBT/vPvB assessment not available as chemical safety assessment not required/not conducted |
| Other adverse effects | No data available |

13. DISPOSAL CONSIDERATIONS

| | |
|--------------------------------|--|
| Waste treatment methods | |
| Product | Contact a licensed professional waste disposal service to dispose of this material. Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. |
| Contaminated packaging | Dispose of as unused product. |

14. TRANSPORT INFORMATION

| | | | | | |
|----------------------------------|---------------------|--------|----------|----------------|-----------|
| DOT (US) | | | | | |
| UN number: | 1193 | Class: | 3 | Packing Group: | II |
| Proper shipping name: | Methyl ethyl ketone | | | | |
| Reportable Quantity (RQ): | 5000 lbs. | | | | |
| Poison inhalation hazard: | No | | | | |

| | | | | | | | |
|------------------------------|---------------------|--------|----------|----------------|-----------|---------|-----------------|
| IMDG | | | | | | | |
| UN number: | 1193 | Class: | 3 | Packing Group: | II | EMS-No: | F-E, S-D |
| Proper shipping name: | ETHYL METHYL KETONE | | | | | | |

| | | | | | | | |
|------------------------------|---------------------|--------|----------|----------------|-----------|--|--|
| IATA | | | | | | | |
| UN number: | 1193 | Class: | 3 | Packing Group: | II | | |
| Proper shipping name: | Ethyl methyl ketone | | | | | | |

15. REGULATORY

| Information United States | |
|---|--|
| SARA 302 Components | No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302. |
| SARA 313 Components | The following components are subject to reporting levels established by SARA Title III, Section 313: |
| SARA 311/312 Components | Fire Hazard, Acute Health Hazard, Chronic Health Hazard |
| Massachusetts Right To Know Components | Methyl ethyl ketone |
| Pennsylvania Right To Know Components | Methyl ethyl ketone |
| New Jersey Right To Know Components | Methyl ethyl ketone |
| California Prop. 65 Components | This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm. |

16. OTHER

| INFORMATION | |
|--|--|
| Full text of H-Statements referred to under sections 2 and 3. | |
| Eye Irrit. | Eye irritation |
| Flam Liq. | Flammable Liquid |
| H225 | Highly flammable liquid and vapor |
| H319 | Causes serious eye irritation |
| H336 | May cause drowsiness or dizziness |
| STOT SE | Specific target organ toxicity – single exposure |
| HMIS RATING | |
| Health Hazard | 2 |
| Chronic health hazard | * |
| Flammability | 3 |
| Physical hazard | 0 |
| NFPA RATING | |
| Health Hazard | 2 |
| Fire Hazard | 3 |
| Reactivity hazard | 0 |

DATA

SOURCES:**REFERENCES**

ACGIH. 2013 Guide to Occupational Exposure Values. Cincinnati, OH. Signature Publications, 2013.
 Forsberg, K.; Mansdorf, S.Z. Quick Selection Guide to Chemical Protective Clothing. Fifth Edition. Hoboken, NJ. John Wiley & Sons, 2007.
 Lide, D.R. CRC Handbook of Chemistry and Physics. 88th Edition. Boca Raton, FL. CRC Press, 2008.
 UNECE. Globally Harmonized System of Classification and Labeling of Chemicals (GHS). Third Revised Edition. New York and Geneva. United Nations, 2009.
 US DOT; Pipeline and Hazardous Materials Safety Administration. 2008 Emergency Response Guidebook.

Neenah, WI. J.J. Keller & Associates, Inc. 2008.

US EPA. Consolidated List of Chemicals Subject to the Emergency Planning and Community Right-To-Know Act (EPCRA) and Section 112(r) of the Clean Air Act. [Available] Online: <http://www.epa.gov/ceppo/pubs/title3.pdf>. Retrieved 02/02/2011.

ADDITIONAL SDS INFORMATION:

KEY / LEGEND

ACGIH - American Conference of Governmental Industrial Hygienists

ADR - Agreement on Dangerous Goods by Road

CAA - Clean Air Act

CAS - Chemical Abstracts Service Registry Number

CDG - Carriage of Dangerous Goods By Road and Rail Manual

CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act

CFR - Code of Federal Regulations

EINECS - European Inventory of Existing Chemical Substances Registry Number

ERG - Emergency Response Guidebook

EPCRA - Emergency Planning and Community Right-to-Know Act

GHS - Globally Harmonized System of Classification and Labeling of Chemicals

IARC - International Agency for Research on Cancer

IATA - International Air Transport Association

ICAO - International Civil Aviation Organization

IMDG - International Maritime Dangerous Goods Code

IMO - International Maritime Organization

N/E - Not Established

NTP - National Toxicology Program

OSHA - Occupational Safety and Health Administration

PEL - Permissible Exposure Limit

PPE - Personal Protective Equipment

RCRA - Resource Conservation and Recovery Act

RID - Regulations Concerning the International Transport of Dangerous Goods by Rail

RQ - Reportable Quantities

SARA - Superfund Amendments and Reauthorization Act of 1986

SDS - Safety Data Sheet

TCC - Tag Closed Cup

TDG - Transportation of Dangerous Goods

TLV - Threshold Limit Value

TSCA - Toxic Substance Control Act

UN/NA - United Nations / North American Number

UNECE - United Nations Economic Commission for Europe

US DOT - United States Department of Transportation

US EPA - United States Environmental Protection Agency

Vol. - Volume

WHMIS - Workplace Hazardous Materials Information System

GENERAL STATEMENTS: Other information not included anywhere else in this SDS is included in this section if, in fact, such data exists.

MANUFACTURER DISCLAIMER: This information relates to the specific material designated and may not be valid for such material used in combination with any other materials or in any process. Such information is to the best of our knowledge and belief, accurate and reliable as of the date compiled. However, no representation, warranty or guarantee is made as to its accuracy, reliability or completeness. NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, IS MADE CONCERNING THE INFORMATION HEREIN PROVIDED. It is the user's responsibility to satisfy himself as to the suitability and completeness of such information for his own particular use. We do not accept liability for any loss or damage that may occur from the use of this information nor do we offer warranty against patent infringement.