FMC Lithium

**Material Safety Data Sheet**


**MSDS Ref. No:** QS-MSD-057
**Version:** US/Canada
**Date Approved:** 12/15/07
**Revision No:** 7

## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

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|---|---|
| **PRODUCT NAME:** | Lithium Molybdate |
| **CHEMICAL FAMILY:** | Molybdates |
| **MOLECULAR FORMULA:** | $Li_2MoO_4$ |
| **ALTERNATE TRADE NAME(S):** | ADVAGUARD™ 591 |
| **GENERAL USE:** | Industrial Manufacturing |

**MANUFACTURER**
FMC CORPORATION
Lithium Division
P.O. Box 795
Bessemer City, NC 28016-0795
**General Information:** (704) 868-5300

**Emergency Telephone Numbers:**
**CHEMTREC** (800) 424-9300
**Emergency Phone** (704) 629-5361 (Plant) Call Collect 24 Hr/Day
**Emergency Phone** (303) 595-9048 (Medical) Call Collect

## 2. COMPOSITION / INFORMATION ON INGREDIENTS

| Chemical Name | CAS # | Wt.% |
|---|---|---|
| Lithium molybdate | 13568-40-6 | 99 |
| Lithium carbonate | 554-13-2 | 1 |

## 3. HAZARDS IDENTIFICATION

**EMERGENCY OVERVIEW**

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| **IMMEDIATE CONCERNS:** | Odorless, white powder. |
| **POTENTIAL HEALTH EFFECTS:** | Exposure to large amounts of molybdenum may irritate the upper respiratory tract and damage the liver, spleen and kidneys. |

**COMMENTS:**
(See Section 11, Toxicological Information)

## 4. FIRST AID MEASURES

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| **EYES:** | Flush with water for at least 15 minutes. If irritation occurs and persists, contact a medical doctor. |
| **SKIN:** | Wash with plenty of soap and water. Get medical attention if irritation occurs and persists. |
| **INGESTION:** | Drink 1 or 2 glasses of water and induce vomiting by touching the back of the throat with a finger or by giving syrup of ipecac. Never induce vomiting or give anything by mouth to an unconscious person. Contact a medical doctor. |
| **INHALATION:** | Remove to fresh air. If breathing difficulty or discomfort occurs and persists, obtain medical attention. |

**NOTES TO MEDICAL DOCTOR:**
This product is anticipated to have low oral toxicity and may be irritating to eyes, skin and mucous membranes. Treatment is symptomatic and supportive.

## 5. FIRE FIGHTING MEASURES

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| **FLAMMABLE LIMITS:** | Upper: Not available Lower: Not available. |
| **GENERAL HAZARD:** | No known physical hazard, non-combustible. |
| **EXTINGUISHING MEDIA:** | Dry chemical, CO2, water spray or regular foam. |
| **HAZARDOUS COMBUSTION PRODUCTS:** | None |
| **FIRE FIGHTING PROCEDURES:** | Wear full protective clothing and self-contained breathing apparatus (SCBA) approved for fire fighting. This is necessary to protect against the hazards of heat, products of combustion and oxygen deficiency. Do not breathe smoke, gases or vapors generated. |
| **AUTOIGNITION TEMPERATURE:** | Not applicable |
| **PROPERTIES CONTRIBUTING TO FLAMMABILITY:** | None |
| **FLASH POINT:** | Not applicable |
| **SENSITIVITY TO STATIC DISCHARGE:** | Not applicable |
| **SENSITIVITY TO IMPACT:** | Not applicable |

**COMMENTS:**
(See Section 10, Stability and Reactivity)

## 6. ACCIDENTAL RELEASE MEASURES

**RELEASE NOTES:** Sweep up and place in suitable container. Dispose of waste according to local and Federal laws and regulations.
Before cleanup measures begin, review the entire MSDS with particular attention to Section 3, Emergency Overview and Potential Health Effects; and Section 8, Recommended Personal Protective Equipment.

## 7. HANDLING AND STORAGE

**HANDLING:** Avoid contact with eyes, skin or clothing. Use with adequate ventilation. Wear safety glasses or goggles and rubber gloves. Wash thoroughly after handling.

**STORAGE:** Keep container closed.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

**EXPOSURE LIMITS**

| Chemical Name | TWA (ACGIH) | STEL/Ceiling (ACGIH) | PEL (OSHA) | STEL/Ceiling (OSHA) |
|---|---|---|---|---|
| Molybdenum, soluble compounds [as Mo] | 5 mg/m³ (respirable) | | 5 mg/m³ | |

**ENGINEERING CONTROLS:**
Use local exhaust ventilation to keep airborne concentrations below exposure limits.

**PERSONAL PROTECTIVE EQUIPMENT**

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|---|---|
| **Eyes And Face:** | Safety glasses or goggles |
| **Respiratory:** | When engineering controls are not adequate, wear a NIOSH/MSHA respirator approved for protection against inorganic dusts. |
| **Protective Clothing:** | Rubber gloves |
| **Work Hygienic Practices:** | Quick-drench eyewash and safety shower. |

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**ODOR:** Odorless

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| **APPEARANCE:** | White powder |
| **pH:** | (40% solution) @ 25°C: 7.0-7.5 |
| **PERCENT VOLATILE:** | Not applicable |
| **VAPOR PRESSURE:** | Not applicable |
| **VAPOR DENSITY:** | Not applicable |
| **BOILING POINT:** | A 30% aqueous solution boils at 102ºC |
| **MELTING POINT:** | 705ºC (1300ºF) |
| **SOLUBILITY IN WATER:** | 45 % by wt. @ 25ºC (77ºF) |
| **EVAPORATION RATE(Butyl Acetate = 1):** | Not applicable |
| **SPECIFIC GRAVITY:** | 1.6 g/cm$^3$ |
| **MOLECULAR WEIGHT:** | 173.82 |
| **COEFF. OIL/WATER:** | Not applicable |
| **ODOR THRESHOLD:** | Not applicable |
| **FLAMMABLE LIMITS:** | Upper: Not available Lower: Not available. |
| **FLASH POINT:** | Not applicable |
| **AUTOIGNITION TEMPERATURE:** | Not applicable |
| **EXPLOSIVE PROPERTIES:** | Not explosive |
| **OXIDIZING PROPERTIES:** | Not an oxidizer |

## 10. STABILITY AND REACTIVITY

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|---|---|
| **CONDITIONS TO AVOID:** | None |
| **STABILITY:** | Stable |
| **POLYMERIZATION:** | Will not occur |
| **HAZARDOUS DECOMPOSITION PRODUCTS:** | None |
| **INCOMPATIBLE MATERIALS:** | None |

## 11. TOXICOLOGICAL INFORMATION

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|---|---|---|
| **Eye Contact:** | No data available for the product. | |
| | Li carbonate: Moderately irritating (rabbit) | [FMC I87-0998] |
| **Skin Contact:** | Non-corrosive, Corrositex In-Vitro Skin Corrosion | [FMC LD 16557] |
| **Skin Absorption:** | No data available for the product. | |
| | Li carbonate: LD50 >2000 mg/kg (rat) | [FMC I96-2084] |
| **Ingestion:** | No data available for the product. | |
| | Li carbonate: LD50 = 525 mg/kg (rat) | [RTECS] |
| **Inhalation:** | No data available for the product. | |
| | Li carbonate: LC50 >0.80 mg/L (4 hr. rat); No mortality at maximum attainable concentration | [FMC I93-1800] |

**Acute Effects From Overexposure:**
No data available for the product.
Lithium carbonate: Lithium carbonate has low oral and dermal toxicity and is moderately irritating to the eyes. It is not sensitizing and is essentially non-irritating to the skin. Inhalation of high concentrations of molybdenum may also cause irritation of the upper respiratory tract.

**Chronic Effects From Overexposure:**
No data available for the product.

EFFECTS OF OVEREXPOSURE TO LITHIUM ION:
The use of this product in industrial and commercial applications presents no significant toxicity hazard. The symptoms described below are based on therapeutic applications where relatively large doses are taken orally by medically supervised patients.
Lithium carbonate is used therapeutically at 500-2000 mg/day oral doses for specific mental disorders. Therapeutic effects occur at blood levels of 2.8 - 8.3 mg of lithium per liter. Minimal signs of toxicity may also occur at these therapeutic levels and involve primarily gastrointestinal upset. Increased dosage can produce tremors, drowsiness and unsteady gait. Signs of toxicity resolve rapidly on cessation of treatment. Prolonged treatment at toxic levels result in dehydration, kidney damage, weight loss and thyroid disturbances.
Some studies of pregnant mice and rats were associated with birth defects but only at dose levels large enough to produce signs of severe maternal toxicity. Although data from the 1970's and 1980's suggested an increase in cardiovascular defects in babies born in women on lithium carbonate therapy, more recent studies have not found any association between lithium exposure and birth defects. Women receiving therapeutic lithium carbonate treatment at the time of confinement have the potential for delivery of a fetus with poor muscle tone, slowed heart rate and cyanosis. Full recovery usually occurs within 2-10 days postpartum. Therapeutic and greater levels of lithium may pose a risk to the conceptus and potential benefits to the mother are weighed carefully in clinical situations.
Exposure to lithium in industrial settings is not considered to pose a risk to human health. NIOSH studied 25 workers exposed to lithium-containing dust at air concentrations exceeding 10 mg/m³ (nuisance dust limit) and found that typical industrial exposure to lithium will not result in blood levels sufficiently high to produce toxicity in either adults or their offspring. [NIOSH, Health Hazard Evaluation report HHE80-036-922]

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| **Sensitization:** | No data available for the product.<br>Lithium carbonate: Non-sensitizing (guinea pig) [FMC I93-1801] |
| **Carcinogenicity:** | EH40: Not listed.<br>IARC: Not listed.<br>NTP: Not listed.<br>OSHA: Not considered a carcinogen under OSHA.<br>ACGIH: Not listed |
| **Mutagenicity:** | No |
| **Reproductive Toxicity:** | No |

## 12. ECOLOGICAL INFORMATION

**Ecotoxicological Information:**
Environmental toxicity testing of the product has not been carried out. Data for a similar substance, sodium molybdate, is provided below:
Sodium Molybdate:
96 hr. $LC_{50}$ = 7600 mg/l (fish)
48 hr. $EC_{50}$ = 330 mg/l (daphnids)
72 hr. $IC_{50}$ >100 (algal growth)
Lithium carbonate is expected to be moderately toxic to aquatic invertebrates (Daphnia magna: 48-hour EC50 = 33.2 mg/L) [FMC Study I96-2085], and freshwater fish (Rainbow trout: 96-hour LC50 = 30.3 mg/L [FMC Study I96-2086].

**Chemical Fate Information:**
Lithium molybdate exists as the inorganic ions of lithium and molybdenum in aqueous solutions. Lithium molybdate is not biodegraded, bioaccumulated or photodegraded.

## 13. DISPOSAL CONSIDERATIONS

**DISPOSAL METHOD:** Dispose of waste according to local and Federal laws and regulations.

## 14. TRANSPORT INFORMATION

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|---|---|
| **PROPER SHIPPING NAME:** | None |
| **CLASSIFICATION:** | None |
| **LABELS:** | None |
| **UN NUMBER:** | None |
| **PACKING GROUP:** | None |
| **FLASH POINT:** | Not applicable |
| **CUSTOM TARIFF NO:** | 2841.70.0000 |
| **MARINE POLLUTANT:** | No |
| **PIH:** | Not designated Poison Inhalation Hazard by US DOT. |

## 15. REGULATORY INFORMATION

**UNITED STATES**

| | |
|---|---|
| **SECTION 311 HAZARD CATEGORY (40 CFR 370):** | Immediate (Acute) Health Hazard |
| **SECTION 313 REPORTABLE INGREDIENTS (40 CFR 372):** | This product contains lithium carbonate which is subject to the reporting requirements of Section 313 of the Emergency Planning and Right-To-Know Act of 1986. This information must be included in all MSDS's that are copied and distributed for this material. |
| **SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355):** | Not listed |
| **CERCLA HAZARDOUS SUBSTANCE (40 CFR 302.4):** | Not listed |
| **TSCA SEC 12B EXPORT NOTIFICATION:** | This product is not subject to TSCA 12 (b) Export Notification Requirements. |
| **TSCA INVENTORY STATUS (40 CFR 710):** | Listed |

**CANADA**

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|---|---|
| **WHMIS:** | Product Identification No.: None<br>Hazard Classification: Class D, Division 2B (eye and skin irritant)<br>Ingredient Disclosure List: Not listed |

## 16. OTHER INFORMATION

**REVISION SUMMARY:** Revision # 7: Regular review completed. Sections 11, 12 and 14 revised.

**NFPA RATING**

**HEALTH:** 1
**FLAMMABILITY:** 0
**REACTIVITY:** 0
**SPECIAL:** None

This MSDS has been prepared to meet U. S. OSHA Hazard Communication Standard, 29 CFR 1910.1200 and Canada's Workplace Hazardous Materials Information System (WHMIS) requirements.
type 1b