1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Methyllithium 9307
CHEMICAL FAMILY: Alkyl lithium
MOLECULAR FORMULA: CH₃Li
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. HAZARDS IDENTIFICATION

CLASSIFICATION:
Flammable liquid, Category 3
Corrosive to skin; Category 1A
Aspiration hazard; Category 1
Specific target organ systemic toxicity – Single exposure; Category 3
Hazardous to the aquatic environment – Chronic; Category 2

LABELING:
SYMBOLS: Flame, Corrosion, Health Hazard, Exclamation mark, Environment,
SIGNAL WORD: Danger
HAZARD STATEMENTS:
Highly flammable liquid and vapour
Causes severe skin burns and eye damage
May be fatal if swallowed and enters airways
May cause respiratory irritation
Toxic to aquatic life with long lasting effects

PRECAUTIONARY STATEMENTS:
Prevention:
Keep away from heat, sparks or open flame- No smoking.
Do not breathe dusts or mists
Keep container tightly closed.
Wear chemical splash goggles with a face shield, rubber gloves and rubber clothing.
Ground/Bond container and receiving equipment
Wash thoroughly after handling.
Avoid breathing vapours.
Use only outdoors or in a well ventilated area.
Avoid release to the environment.

Response:
In case of fire, DO NOT USE WATER OR CARBON DIOXIDE. Use dry chemical.
Collect spillage

First Aid:
3. COMPOSITION / INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS #</th>
<th>EC No</th>
<th>Wt.%</th>
<th>Classification, Hazard Statement Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cumene</td>
<td>98-82-8</td>
<td>202-704-5</td>
<td>82</td>
<td>Flam. liq. Cat. 3 H226</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Asp. Tox. Cat. 1 H304</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>STOT SE Cat. 3 H335</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Aquatic Chronic Cat. 2 H411</td>
</tr>
<tr>
<td>Tetrahydrofuran</td>
<td>109-99-9</td>
<td>203-726-8</td>
<td>14</td>
<td>Flam. liq. Cat. 2 H225</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Eye Irrit. Cat. 2 H319</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>STOT SE Cat. 3 H335</td>
</tr>
<tr>
<td>Methyllithium</td>
<td>917-54-4</td>
<td>213-026-4</td>
<td>3</td>
<td>Skin Corr. Cat 1A H314</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

**EYES:**
Immediately flush with water for at least 15 minutes, lifting the upper and lower eyelids intermittently. See a medical doctor or ophthalmologist immediately.

**SKIN:**
Quickly wipe off as much as possible, then immediately flush with plenty of water while removing contaminated clothing and/or shoes. Thoroughly wash with soap and water. Obtain immediate medical attention. Contact a medical doctor if necessary.

**INGESTION:**
Quickly wipe material from the mouth and rinse mouth with water. Do not induce vomiting. Never give anything by mouth to an unconscious person. See a medical doctor immediately.

**INHALATION:**
Remove to fresh air. If breathing discomfort occurs and persists, see a medical doctor. If breathing has stopped, give artificial respiration and see a medical doctor immediately.

**NOTES TO MEDICAL DOCTOR:**
This product is corrosive and reacts violently with water. Formulated product is in a solution; corrosive and reactive properties are still present. Treatment should first remove as much of the material as possible as quickly as possible, then flush with very large quantities of water. Ingestion presents a singular problem as emesis may produce esophageal damage and/or aspiration damage. Consideration may be given to gastric lavage with a large diameter tube for removal of material and then dilution with large amounts of water. Esophagoscopy may be of assistance in this procedure and to assess extent of damage. Treatment is otherwise symptomatic and supportive.

5. FIRE FIGHTING MEASURES

**FLAMMABLE LIMITS:**
Upper: 11.8% (THF) Lower: 2% (THF)

**GENERAL HAZARD:**
Flammable liquid. Reacts violently with water to give off flammable gases and corrosive dust.

**EXTINGUISHING MEDIA:**
DO NOT USE WATER OR CARBON DIOXIDE. Use dry chemical.

**HAZARDOUS COMBUSTION PRODUCTS:**
Lithium hydroxide, carbon dioxide, carbon monoxide.

**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:** Water reactivity and volatility of solvents.

**FLASH POINT:** 8°C (46°F), -14.4°C (THF)

**SENSITIVITY TO STATIC DISCHARGE:** Yes

**SENSITIVITY TO IMPACT:** None

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

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6. ACCIDENTAL RELEASE MEASURES

**RELEASE NOTES:** Remove all sources of ignition. Do not use water in the initial phases of clean up. Contain spill with absorbant. Transfer to approved transport container and clean up spillage with an absorbant. 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.

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7. HANDLING AND STORAGE

**HANDLING:** Use in a closed system under argon or nitrogen. Do not get in eyes, on skin or clothing. Do not breathe vapors or mist.

**STORAGE:** Store in a cool place. Keep container closed. Keep away from sources of ignition, water, air, acids and oxidizing agents.

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8. EXPOSURE CONTROLS / PERSONAL PROTECTION

<table>
<thead>
<tr>
<th>EXPOSURE LIMITS</th>
<th>Chemical Name</th>
<th>TWA (ACGIH) ppm</th>
<th>STEL/Ceiling (ACGIH) ppm</th>
<th>PEL (OSHA) ppm</th>
<th>STEL/Ceiling (OSHA) ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cumene</td>
<td>50 ppm</td>
<td>100 ppm</td>
<td>50 ppm</td>
<td>200 ppm</td>
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<tr>
<td></td>
<td>tetrahydrofuran</td>
<td>50 ppm</td>
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</table>

**ENGINEERING CONTROLS:** Use in closed system under argon or nitrogen. If personal contact can occur, use local exhaust ventilation (explosion-proof), to keep airborne concentrations below exposure limits.

**PERSONAL PROTECTIVE EQUIPMENT**

**Eyes And Face:** Chemical splash goggles with a face shield.

**Respiratory:** When engineering controls are not adequate, wear a NIOSH/MSHA respirator approved for protection against organic vapors and mists.

**Protective Clothing:** Rubber gloves and rubber clothing.

**Work Hygienic Practices:** Quick-drench eyewash and safety shower.

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9. PHYSICAL AND CHEMICAL PROPERTIES
ODOR: Aromatic
APPEARANCE: Clear, light yellow solution
pH: Not applicable
PERCENT VOLATILE: 96
VAPOR PRESSURE: 162.1 mm Hg at 20 °C (THF)
VAPOR DENSITY: Not applicable
BOILING POINT: 120 °C (product), 66 °C (THF), 152 °C (Cumene)
MELTING POINT: -108.5 °C (THF), -96 °C (Cumene); Product will crystallize at low temperature.
SOLUBILITY IN WATER: Reacts violently with water
EVAPORATION RATE (Butyl Acetate = 1): 8 (THF)
SPECIFIC GRAVITY: 0.857 g/ml
MOLECULAR WEIGHT: 21.97
COEFF. OIL/WATER: Log P(oct) = 3.66 (cumene)
ODOR THRESHOLD: THF: Odor Threshold: 7.3-10.2 mg/m3 (2.48-3.47 ppm) (recognition); 180 mg/m3 (61.2 ppm) (distinct odor)
FLAMMABLE LIMITS: THF: Upper: 11.8% Lower: 2%
Cumene: Upper: 6.5% Lower: 0.9%
FLASH POINT: 8°C (product), -17°C (THF), 36 °C (cumene)
AUTOIGNITION TEMPERATURE: 425 °C (cumene)
VISCOSITY: Not available
FLAMMABILITY: Water reactive material in flammable liquid solvent
DECOMPOSITION TEMPERATURE: Not available
EXPLOSIVE PROPERTIES: Not explosive
OXIDIZING PROPERTIES: Not an oxidizer

10. STABILITY AND REACTIVITY

CONDITIONS TO AVOID: Water, heat, sparks, open flame.
STABILITY: Stable at temperatures less than 40°C (104°F).
POLYMERIZATION: Does not polymerize
HAZARDOUS DECOMPOSITION PRODUCTS: Lithium oxide, lithium hydroxide, magnesium oxide and flammable methane gas.
INCOMPATIBLE MATERIALS: Acids, oxidizers, oxygen.

11. TOXICOLOGICAL INFORMATION

Eye Contact: No data available for the product.
Methylthiium: Corrosive
Skin Contact: No data available for the product.
Methylthiium: Corrosive
Skin Absorption: No data available for the product.
Methylthiium: Corrosive
Cumene: Dermal LD₅₀ = 12300 uL/kg (rabbit) [RTECS]
Ingestion: No data available for the product.
Methylthiium: Corrosive
Cumene: Oral LD₅₀ = 1400 mg/kg (rat) [RTECS]
THF: Oral LD₅₀ = 1650 mg/kg (rat) [RTECS]
**Inhalation:**
No data available for the product.
Methylthium: Corrosive
Cumene: Inhalation LC50 = 10 gm/m³/7H (mouse) [RTCS]
THF: Inhalation LC50 = 21,000 ppm, 3 hr., (rat) [RTCS]

**Acute Effects From Overexposure:**
No data available for the product. This product contains an alkylthium compound which is extremely reactive and corrosive to skin, eyes (may cause blindness), nose, throat and stomach. Inhalation of vapors may cause dizziness, nausea, anesthesia, numbness, burning sensation and motor weakness in fingers and toes, incoordination, and headache. Low viscosity material—if swallowed may enter the lungs and cause lung damage.

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

**THF:** Repeated or prolonged exposure may cause signs of central nervous system depression and respiratory irritation.

**Sensitization:**
No

**Carcinogenicity:**
EH40: Not listed.
IARC: Not listed.
NTP: Tetrahydrofuran is listed as a substance that is reasonably be anticipated to be a carcinogen.
OSHA: Not considered a carcinogen under OSHA.
OTHER: ACGIH: Tetrahydrofuran is listed as Category A3, a confirmed animal carcinogen with unknown relevance to humans.

**Mutagenicity:**
No data available for the product.
THF: THF gave negative results in bacterial mutagenicity tests with and without metabolic activation.

**Reproductive Toxicity:**
No data available for the product.
THF: One animal study suggests that THF does not cause effects at doses which are not maternally toxic.

**12. ECOLOGICAL INFORMATION**

**Ecotoxicological Information:**
Environmental toxicity testing of the product has not been carried out.

**Cumene:**
48 hour LC50 = 0.6 ppm (Daphnia magna)
96 hour LC50 = 6.32 mg/l/96 (Fathead minnow) [Handbook Env. Data on Org. Chem., 4th Ed]

**THF:**
48 hr. LC50 = 2820; 2930 mg/l (orfe)
96 hr. LC50 = 2160 mg/L (fathead minnow) [Handbook Env. Data on Org. Chem., 4th Ed]

**Chemical Fate Information:**
No data available for the product. Methylthium reacts violently with water to form methane and lithium hydroxide.

**Cumene:** Cumene is readily volatilized from surface water and soil and is expected to have low to moderate environmental persistence. Cumene which is not volatilized and degraded is expected to be biodegraded or
adsorbed to soil particles.

THF: Tetrahydrofuran is expected to volatilize from both water and soil and leach into groundwater. It will not photodegrade or adsorb to sediment. Limited evidence suggests it may biodegrade. Based on a relatively low Kow (0.47), it is not expected to bioconcentrate.

13. DISPOSAL CONSIDERATIONS

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

14. TRANSPORT INFORMATION

UN NUMBER: UN2924
PROPER SHIPPING NAME: Flammable liquid, corrosive, N.O.S. (methyllithium in cumene/tetrahydrofuran)
CLASSIFICATION: 3, Flammable liquid, (8, Corrosive)
LABELS: Flammable, Corrosive
PACKING GROUP: II
FLASH POINT: 8°C (46°F), -14.4 ºC (THF)
CUSTOM TARIFF NO: 2931.00.9160
MARINE POLLUTANT: No
PIH: Not designated Poison Inhalation Hazard by US DOT.

15. REGULATORY INFORMATION

UNITED STATES
SECTION 311 HAZARD CATEGORY (40 CFR 370): Reactive, fire hazard, immediate (acute) health hazard.
SECTION 313 REPORTABLE INGREDIENTS (40 CFR 372):
This product contains cumene which is a substance subject to the reporting requirements of Section 313 of the Emergency Planning and Community 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): Cumene and tetrahydrofuran are listed. The reportable quantities are 5000 pounds and 1000 pounds, respectively. This product is subject to TSCA 12(b) Export Notification requirements due to the presence of tetrahydrofuran. Listed
TSCA SEC 12B EXPORT NOTIFICATION:
TSCA INVENTORY STATUS (40 CFR 710): Listed
CANADA
WHMIS:

Product Identification No.: 2924
Hazard Classification: Class B, Division 2 (Flammable liquid)
Class B, Division 6 (Reactive Flammable Materials/Flammable gas on contact with water)
Class E, (Corrosive)
Ingredient Disclosure List: Isopropylbenzene (cumene) and tetrahydrofuran are listed.

16. OTHER INFORMATION

REVISION SUMMARY: Revision # 8: Sections 2, 3, 9, 14 & 16 were revised. Regular review completed.

NFPA RATING

HEALTH: 3
FLAMMABILITY: 4
REACTIVITY: 2
SPECIAL: W

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.

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