Product Names  Methyllithium, Methyllithium 9307, MeLi

Formula  CH₃–Li

Appearance  Colorless to light yellow solution.

Application  MeLi is a formulation of methyllithium in THF/cumene that is non-pyrophoric and does not contain highly flammable diethyl ether. The product is stabilized through the addition of magnesium to yield a molar ratio of Li:Mg of 93:07. The presence of magnesium increases solubility and greatly reduces the rate of thermal decomposition, which can lead to the build-up of methane gas pressure. MeLi can be used for methylation via 1,2 addition to carbonyl or nitrile compounds. It is also useful in the preparation of vitamin and steroid derivatives, in carbene-type reactions in the formation of allenes and alkoxycyclopoyanes, and in metatation reactions in the preparation of halogenated alkyl lithium and steroidal alkyl compounds. It can be used in the reduction of certain transition metal halides [e.g., PdCl₂ to Pd (0)], in the preparation of lithium methyl cuprates for 1,4-conjugate addition, and to prepare other organometallics [e.g., Me₂Mg, MeTi(NEt₂)₃, Me₃Al, Me₃As, Me₃In or Me₃Ga].

Product Specification

Methyllithium, wt%  Guaranteed* 2.7 - 3.0 (1.12M)

* This product can be made to agreed upon customer specifications.

Solvent  THF, wt.%  15
         Cumene, wt.%  82

Physical Properties

Molecular weight  21.97
Density @20°C  0.86g/mL (7.18 lb/gal)
Contained MeLi  24.9g/L (0.21 lb/gal)
Pyrophoricity  Non-pyrophoric

Solubility  The solubility of methyllithium at >15°C is 1.3 M; however, at 0°C, the solubility is 0.9 M. At <0°C, MeLi precipitates as large MeLi•THF crystals which redissolve on warming and with agitation.

Thermal Stability  At 15°C and 40°C, the average decomposition rates were 0.008 and 0.09 wt. % per day, respectively. Recommended storage: 10°C for a maximum of 60 days and 0°C for 3-6 months. At 40°C, a slight pressure develops in containers and the product color changes to dark orange. MeLi degrades by metatation of the aromatic solvent to afford methane gas and cumyllithiums.
METHYLLITHIUM (MeLi-9307)  
CAS No. 917-54-4  
FMC Product Code No. 518-01

**Toxicity/Safety Data**  
Flammable liquid. Water reactive. In case of fire do not use water or carbon dioxide. Corrosive to eyes (may cause blindness), skin, respiratory tract, mucous membranes. Inhalation of vapors may cause dizziness, nausea, anesthesia, numbness, motor weakness in fingers and toes, incoordination, and headache. If ingested, may produce a lung aspiration hazard.

**Handling/Storage/Disposal**  
Use in a closed system under argon or nitrogen. Do not get in eyes, on skin or clothing. Do not breathe vapors or mist. Store in a cool place. Keep container closed. Keep away from sources of ignition, water, air, acids and oxidizing agents.

**Shipping Containers**  
- Bulk containers: 2000 – 20000 L
- Cylinders: #5 – 420 L

**Shipping Limitations**  
Shipments of MeLi are described as "Flammable Liquid, Corrosive, N.O.S., (METHYLLITHIUM 9307 IN TETRAHYDROFURAN/CUMENE), 3 (8), UN2924, PGII." Shipments require "Flammable Liquid" and "Corrosive" labels.

<table>
<thead>
<tr>
<th>Mode</th>
<th>Class (8)</th>
<th>IMDG</th>
<th>DOT</th>
<th>RID/ADR</th>
<th>IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post, Parcel</td>
<td>Class 3</td>
<td>Not acceptable</td>
<td>Class 3</td>
<td>Class 3</td>
<td>Class 3</td>
</tr>
<tr>
<td>Sea</td>
<td>(8)</td>
<td>(IMDG)</td>
<td>(DOT)</td>
<td>(RID/ADR)</td>
<td>(IATA)</td>
</tr>
<tr>
<td>Road, Rail (USA)</td>
<td>Class 3 (8)</td>
<td></td>
<td>Class 3 (8)</td>
<td>Class 3</td>
<td></td>
</tr>
<tr>
<td>Road, Rail (EU)</td>
<td>Class 3 (8)</td>
<td></td>
<td>Class 3 (8)</td>
<td>Class 3</td>
<td></td>
</tr>
<tr>
<td>Air</td>
<td>Class 3 (8)</td>
<td></td>
<td>Class 3 (8)</td>
<td>Class 3</td>
<td></td>
</tr>
</tbody>
</table>

2.5 L maximum per inner glass container.  
5.0 L maximum per single/outer container.  
Cargo aircraft only.

For shipments within Europe, labeling for supply requirements are:

- **F**    Highly Flammable
- **C** Corrosive
- **N** Dangerous for the Environment
- R&S Phrases  See Material Safety Data Sheet

Responsible Care® initiative dictates that all shipments of lithium chemicals must be transported in a DOT-approved vehicle in a responsible manner (i.e., no flat bed trucks).

**Additional Resources**  
Refer to the Organometallics and Reactive Specialty Organics Safe Handling Guide.