OPTIMA CHEMICAL
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METHYLLITHIUM (MeLi-9307)

CAS No. 917-54-4

QS-PDS-018 Revisions: 01

Product Names Methyllithium, Methyllithium 9307, MeLi

Formula CH_3–Li

Appearance Colorless to light yellow solution

Application MeLi is a patented (U. S. Patent 4,976,886) 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 alkoxycyclopopanes, and in metalation reactions in the preparation of halogenated alkynyllithiums and steroidal alkynyl compounds. It can be used in the reduction of certain transition metal halides [e.g., $PdCl_2$ to Pd (0)], in the preparation of lithium methyl cuprates for 1,4-conjugate addition, and to prepare other organometallics [e.g., Me_2Mg, $MeTi(NEt_2)_3$, Me_3Al, Me_3As, Me_3In or Me_3Ga].

Product Specification

	Guaranteed*
Methyllithium, wt%	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 >15ºC is 1.3 M; however, at 0ºC, the solubility is 0.9 M. At <0ºC, MeLi precipitates as large MeLi•THF crystals which redissolve on warming and with agitation.

Thermal Stability At 15ºC and 40ºC, the average decomposition rates were 0.008 and 0.09 wt. % per day, respectively. Recommended storage: 10ºC for a maximum of 60 days and 0ºC for 3-6 months. At 40ºC, a slight pressure develops in containers and the product color changes to dark orange. MeLi degrades by metalation of the aromatic solvent to afford methane gas and cumyllithiums.

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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.

COMPLETE INFORMATION ON TOXICITY AND SAFETY IS CONTAINED IN THE OPTIMA MATERIAL SAFETY DATA SHEET (MSDS) AVAILABLE FOR THIS PRODUCT.

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.

Post, Parcel	Not acceptable
Sea	Class 3 (8) (IMDG)
Road, Rail (USA)	Class 3 (8) (DOT)
Road, Rail (EU)	Class 3 (8) (RID/ADR)
Air	Class 3 (8) (IATA)
	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.