

TMAI IC

Trimethylaluminum

TMAI IC is an aluminum precursor (Select Semiconductor Grade) for deposition technologies used in the silicon semiconductors industry.

CAS number
75-24-1

EINECS/ELINCS No.
200-853-0

TSCA status
listed on inventory

Molecular weight
72.1

Characteristics

Appearance	Clear, colorless liquid
Boiling point, 760 torr	127 °C
Density, 30 °C	0.743 g/cm ³
Melting point	15 °C
Solubility	Soluble in aromatic and saturated aliphatic and cycloaliphatic hydrocarbons
Stability to air	Ignites upon exposure
Stability to water	Reacts violently, may ignite upon contact
Viscosity, 30 °C	0.9 mPa.s

Vapor Pressure

at 10 °C / 283.15 K	4.87 torr
at 15 °C / 288.15 K	6.57 torr
A	2134
B	8.224
Gas constants	$\log P(\text{torr}) = B - A/T(K)$

Thermochemical properties

Heat of vaporization ΔH_v , 127 °C / 1 bar	247 J/g (59 cal/g)
Specific heat, 57 °C	2.213 J/g.°C (0.529 cal/g.°C)
Heat of combustion ΔH_c° , 25 °C	-3180 kJ/mole (-760 kcal/mole)

Applications

For atomic layer deposition (ALD) in Silicon semiconductor applications we offer our TMAI IC grade. This grade offers ppb level of trace metals specifications. Our trimethylaluminum is supplied in canisters (cylinders) made from stainless steel with an electropolished internal finish. The cylinders are equipped with manual or pneumatic diaphragm valves. The valves are equipped with metal gasket VCR-connections.

Storage

TMAI IC is stable when stored under a dry, inert atmosphere and away from heat. CAUTION: TMAI IC may undergo exothermic decomposition with gas evolution at elevated temperatures (see section on Safety and handling).

Packaging and transport

Containers are fabricated from stainless steel with an electropolished internal finish and diaphragm valves. The diaphragm valves are equipped with metal gasket face seal connections such as SwagelokVCR. For more information please refer to our Cylinder Offerings leaflet, available at www.Nouryon.com/hpmpo. Both packaging and transport meet the international regulations. TMAI IC is classified as Organometallic substance, liquid, pyrophoric, water-reactive; Class 4.2; UN 3394; PG I

Safety and handling

TMAI IC ignites upon exposure to air and reacts violently with water. Water must be scrupulously removed from process equipment prior to putting it into metal alkyls service. Failure to do so may result in an explosion. If heated above 120°C (248°F), TMAI IC will undergo exothermic decomposition with evolution of flammable gas. Products of complete combustion of TMAI are aluminum oxide, carbon dioxide and water. TMAI causes severe burns to the skin and eyes. It is imperative that proper personal protective equipment be worn when handling TMAI. Please refer to the Material Safety Data Sheet (MSDS) for further information on the safe storage, use and handling of TMAI IC. This information should be thoroughly reviewed prior to acceptance of this product. The MSDS is available at <https://hpmpo.nouryon.com>.

Additional information

Nouryon uses leading edge processes, purification and transfilling techniques that ensure the repeatable and consistent delivery of our TMAI IC in each cylinder that we supply. We apply state of the art techniques such as ICP-MS and OES for trace metal analysis to meet your demands. Please contact us for detailed sales specifications.

All information concerning this product and/or suggestions for handling and use contained herein are offered in good faith and are believed to be reliable. Nouryon, however, makes no warranty as to accuracy and/or sufficiency of such information and/or suggestions, as to the product's merchantability or fitness for any particular purpose, or that any suggested use will not infringe any patent. Nouryon does not accept any liability whatsoever arising out of the use of or reliance on this information, or out of the use or the performance of the product. Nothing contained herein shall be construed as granting or extending any license under any patent. Customer must determine for himself, by preliminary tests or otherwise, the suitability of this product for his purposes. The information contained herein supersedes all previously issued information on the subject matter covered. The customer may forward, distribute, and/or photocopy this document only if unaltered and complete, including all of its headers and footers, and should refrain from any unauthorized use. Don't copy this document to a website.

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