

# MMAO-21 7 wt% AL in Heptane

## Modified methylaluminoxane

MMAO-21 7 wt% AL in Heptane is used as a co-catalysts in the polymerization of olefins and other monomers via single-site catalysts. Can also be used for tri and tetramerization processes

CAS number  
146905-79-5

EINECS/ELINCS No.  
931-024-8

TSCA status  
listed on inventory

### Characteristics

Appearance	Clear colorless liquid
Density, 25°C	0.723 g/cm <sup>3</sup>
Solubility	Soluble in aromatic and saturated aliphatic and cycloaliphatic hydrocarbons
Stability to air	May ignite on exposure
Stability to water	Reacts violently
Viscosity, 25°C	0.7 mPa.s

### Composition

Active Al	<sup>c</sup> 36-48 wt%
Aluminum	<sup>d</sup> 6.0-8.0 wt%
Hydrogen	<sup>a</sup> $\leq$ 3.0 molar%
Isobutane	<sup>a</sup> 22.0-38.0 molar%
Methane	<sup>a</sup> 62.0-78.0 molar%
Others	<sup>a b</sup> $\leq$ 3.0 molar%

#### Notes:

<sup>a</sup> Calculated from gas chromatographic analysis of hydrocarbons and hydrogen obtained by hydrolysis. <sup>b</sup> Other components include hydrocarbons, such as ethane, propane, isobutylene and n-butane. <sup>c</sup> Determined by titration of aqueous hydrolyzate. <sup>d</sup> Determined by the pyridine titration method. Data for heptane solution containing 7% aluminum; this corresponds to an MMAO-21 concentration of about 18%.

### Applications

Heptane solutions of MMAO-21 are used as cocatalysts in polymerization of olefins and other monomers via single-site catalysts.

### Storage

MMAO-21 in heptane is stable when stored under a dry, inert atmosphere and away from heat. MMAO-21 in heptane is significantly more stable to long-term storage than solutions of conventional polymethylaluminoxane.

## Packaging and transport

Heptane solutions of MMAO-21 are available worldwide in cylinders and portable tanks. In North America only, MMAO-21 in heptane is also available in tank trailers and rail cars. Containers are fabricated from carbon steel and are equipped with dip tubes for top discharge and all connections are located in the vapor space. Both packaging and transport meet the international regulations.

## Safety and handling

Heptane solutions of MMAO-21 may ignite upon exposure to air and react violently with water. Heptane solutions of MMAO-21 must be handled under a dry, inert atmosphere, e.g. nitrogen or argon. 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. Products of complete combustion of heptane solutions of MMAO-21 are aluminum oxide, carbon dioxide and water. Heptane solutions of MMAO-21 cause severe burns to the skin and eyes. It is imperative that proper personal protective equipment be worn when handling heptane solutions of MMAO-21. Please refer to the Safety Data Sheet (SDS) for further information on the safe storage, use and handling of heptane solution of MMAO-21. This information should be thoroughly reviewed prior to acceptance of this product. The SDS is available at [nouryon.com/sds-search](http://nouryon.com/sds-search)

## Additional information

Availability: MMAO-21 in heptane is a commercial product (typically containing ~7% aluminum). The product is not available neat. Consult your Nouryon representative for further information.

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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