

# TIBAL

## Triisobutylaluminum

TIBAL is a co-catalyst product soluble in aromatic and saturated aliphatic and cycloaliphatic hydrocarbons.

CAS number  
100-99-2

EINECS/ELINCS No.  
202-906-3

TSCA status  
listed on inventory

Molecular weight  
198.3

### Composition

Aluminum	<sup>b</sup> ≥ 13.4 wt%
Hydride, as AlH <sub>3</sub>	<sup>a</sup> ≤ 0.8 wt%
Isobutylene	<sup>a</sup> ≤ 4.0 wt%
Other R <sub>3</sub> Al	<sup>a</sup> -- wt%
Triisobutylaluminum	<sup>a</sup> ≥ 95.0 wt%
Tri-n-butylaluminum	<sup>a</sup> ≤ 0.5 wt%

### Characteristics

Appearance	Clear, colorless liquid
Boiling point, 1 mm Hg	46 °C
Density, 30 °C	0.776 g/cm <sup>3</sup>
Melting point	0 °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	1.7 mPa.s

### Thermochemical properties

Heat of vaporization ΔH <sub>v</sub> , NBP / 1 bar	230 J/g (55 cal/g)
Heat of hydrolysis, 25 °C	2782 J/g (665 cal/g)
Specific heat, 57 °C	2.125 J/g.°C (0.508 cal/g.°C)
Heat of formation ΔH <sub>f</sub> <sup>o</sup> , 25 °C / 1 bar	-293 kJ/mole (-70 kcal/mole)
Heat of combustion ΔH <sub>c</sub> <sup>o</sup> , 25 °C	-9029 kJ/mole (-2158 kcal/mole)

#### Notes:

<sup>a</sup> Calculated from gas chromatographic analysis of hydrocarbons and hydrogen obtained by hydrolysis. <sup>b</sup> Determined by titration of aqueous hydrolyzate. <sup>c</sup> NBP = Normal Boiling Point i.e. temperature at which the vapor pressure is 760 mm Hg (1 bar).

### Applications

TIBAL is used as a cocatalyst in the Ziegler-Natta polymerization of olefins.

## Storage

TIBAL and its solutions are stable when stored under a dry, inert atmosphere and away from heat. TIBAL decomposes slowly above ~ 50°C to produce diisobutylaluminum hydride (DIBAL-H) and isobutylene. Further heating will result in decomposition of DIBAL-H to hydrogen, isobutylene and elemental aluminum.

## Packaging and transport

TIBAL and its solutions are available worldwide in cylinders and portable tanks. In North America only, TIBAL 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

TIBAL ignites upon exposure to air and reacts violently with water. Hydrocarbon solutions of TIBAL may also ignite upon exposure to air. TIBAL and its solutions 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 TIBAL and its solutions are aluminum oxide, carbon dioxide and water. TIBAL causes severe burns to the skin and eyes. It is imperative that proper personal protective equipment be worn when handling TIBAL. Please refer to the Safety Data Sheet (SDS) for further information on the safe storage, use and handling of TIBAL. This information should be thoroughly reviewed prior to acceptance of this product. The SDS is available at <https://polymerchemistry.nouryon.com>.

## Additional information

Availability: TIBAL is a commercial product available as the neat pyrophoric liquid and as pyrophoric and non-pyrophoric solutions in a variety of hydrocarbon solvents. 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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The Nouryon logo consists of a stylized orange 'N' followed by the word 'ouryon' in a lowercase, sans-serif font. The 'N' is significantly larger and more prominent than the rest of the text.