DIBAC

Diisobutylaluminum chloride

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

CAS number 1779-25-5	EINECS/ELINCS No. 217-216-8
TSCA status listed on inventory	Molecular weight 176.7

Composition

Aluminum	[b] 15.1-15.5 wt%
Cl/Al (molar)	1.00-1.05 wt%
Hydrogen	[a] ≤ 0.6 molar%
Isobutane	[a] ≥ 97.5 molar%
Isobutylene	[a] ≤ 1.0 molar%
Other alkanes	[a] -- molar%

Characteristics

Appearance	Clear, colorless liquid
Boiling point, 1 mm Hg	108 °C
Density, 30 °C	0.904 g/cm^3
Melting point	-39 °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	4.0 mPa.s

Thermochemical properties

Heat of vaporization ΔHv, NBP / 1 bar	[c] 142 J/g (34 cal/g)
Heat of hydrolysis, 25 °C	2653 J/g (634 cal/g)
Specific heat, 57 °C	1.615 J/g.°C (0.386 cal/g.°C)
Heat of formation ΔHf°, 25 °C / 1 bar	-498 kJ/mole (-119 kcal/mole)
Heat of combustion ΔHc°, 25 °C	-6029 kJ/mole (-1441 kcal/mole)

Notes:

[a] Calculated from gas chromatographic analysis of hydrocarbons and hydrogen obtained by hydrolysis. [b] Determined by titration of aqueous hydrolyzate. [c] NBP = normal boiling point

Applications

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

Storage

DIBAC and its solutions are stable when stored under a dry, inert atmosphere and away from heat. DIBAC slowly decomposes at temperatures above ~ 165°C.

Packaging and transport

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

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

Additional information

DIBAC 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.

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