

DEZ

Diethylzinc

DEZ is an aluminum alkyl used as chain-shuttling agent in block copolymer polymerization. It can also be used as scavenging agent for HDPE production units

CAS number
557-20-0

EINECS/ELINCS No.
209-161-3

TSCA status
listed on inventory

Molecular weight
123.5

Characteristics

Appearance	Clear, colorless to slightly hazy liquid
Boiling point, 760 mm Hg	118 °C
Density, 30 °C	1.198 g/cm ³
Melting point	-30 °C
Solubility	Soluble in aromatic and saturated aliphatic and cycloaliphatic hydrocarbons
Stability to air	Ignites upon exposure
Stability to water	Reacts violently
Viscosity, 21 °C	0.7 mPa.s

Composition

Ethane	^a ≥ 98.5 molar%
Hydrogen	^a ≤ 0.1 molar%
n-Butane	^a ≤ 0.4 molar%
Zinc	^b ≥ 52.0 wt%

Thermochemical properties

Heat of vaporization ΔH_v , NBP	^c 326 J/g (78 cal/g)
Heat of hydrolysis, 25 °C	2117 J/g (506 cal/g)
Specific heat, 57 °C	1.502 J/g.°C (0.359 cal/g.°C)
Heat of formation ΔH_f° , 25 °C / 1 bar	17 kJ/mole (4 kcal/mole)
Heat of combustion ΔH_c° , 25 °C	-3364 kJ/mole (-804 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 i.e. temperature at which the vapor pressure is 760 mm Hg (1 bar).

Applications

DEZ in low concentrations is an effective chain transfer agent for molecular weight control in Ziegler-Natta polymerization of olefins. It is useful in the production of polyethylene film with improved resistance to gelstreaking and pinstripping. It is also used as a scavenger to remove poisons from polyethylene reactors. DEZ has been used in a process for the preservation of books made with modern pulp-based paper. DEZ is also used in pharmaceutical applications where it is used mainly because stereo specifically reactions can be carried out. Well known is the Simmons-Smith cyclopropanation. DEZ is also useful in catalytic asymmetric addition to aldehydes or ketones forming chiral secondary or tertiary alcohols.

Storage

DEZ and its solutions are stable when stored under a dry, inert atmosphere and away from heat. CAUTION: Neat DEZ may undergo violent exothermic decomposition with flammable gas evolution if stored at temperatures above 70°C (see section on Safety & handling).

Packaging and transport

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

DEZ ignites upon exposure to air and reacts violently with water. Hydrocarbon solutions of DEZ may also ignite upon exposure to air. DEZ and its solutions must be handled under a dry, inert atmosphere, e. g. nitrogen or argon. Neat DEZ may undergo exothermic decomposition with evolution of flammable gas if stored above 70°C. The decomposition may become self-accelerating and UNCONTROLLABLE and may result in a violent runaway reaction if heated above 120°C. 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 DEZ and its solutions are zinc oxide, carbon dioxide and water. DEZ causes severe burns to the skin and eyes. It is imperative that proper personal protective equipment be worn when handling DEZ. Please refer to the Safety Data Sheet (SDS) for further information on the safe storage, use and handling of DEZ. This information should be thoroughly reviewed prior to acceptance of this product. The SDS is available at nouryon.com/sds-search.

Additional information

Availability: DEZ is a commercial product available as the neat pyrophoric liquid and as pyrophoric and nonpyrophoric 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.

Contact Us

Polymer Specialties Americas
polymer.amer@nouryon.com

Polymer Specialties Europe, Middle East, India and Africa
polymer.emeia@nouryon.com

Polymer Specialties Asia Pacific
polymer.apac@nouryon.com

The logo for Nouryon, featuring a stylized blue 'N' followed by the word 'ouryon' in a blue sans-serif font.