EASTMAN

Technical Data Sheet

Amietol ™ M21

Chemical Synonym

N,N-Dimethylethanolamine; Dimethylethanolamine; Deanol; DMEA; N,N-Dimethyl-2-Hydroxyethylamine; N,N-Dimethyl-N-ethanolamine

Applications

- Paints & coatings

Product Description

Amietol™ M21 (DMAE) is a clear hygroscopic liquid with an amine-like odor. The freshly distilled product is colorless, but prolonged storage may cause a yellowish discoloration.

The principal applications for Amietol™ M21 include:

Flocculents
DMAE is a key intermediate in the production of dimethylaminoethyl-(meth)acrylate. The water-soluble polymers produced from this ester, mostly by copolymerisation with acrylamide, are useful as flocculents.

Pulp and paper chemicals
The dry strength or wet strength of paper is increased by adding a homopolymer of dimethylaminoethyl(meth)acrylate to the unbleached kraft paper.

Ion exchange resins
Anion exchange resins can be prepared by reacting tertiary amines like DMAE or trimethylamine with the chloromethylated vinyl or styrene resin.

Increased exchange capacity is obtained by reacting a cross-linked polymer, containing haloalkyl functions, with an amine.

The anion exchange membranes are aminated with DMAE.

Polyurethane
In the production of PU foam for insulating purposes, the use of DMAE is a practical and effective way of reducing the total formula cost.

Resins

- Epoxy
  DMAE is an effective and versatile curing agent for epoxy resins. It also acts as viscosity reducing agent for resinous polyamides and other viscous hardeners. DMAE is also an extremely good wetting agent for various filters in epoxy formulations.

- Acrylic
  DMAE improves the acid-dyeing properties of acrylonitrile polymers by copolymerisation of DMAE esters.

  Water-soluble DMAE salts are used to improve the behaviour of coatings and films to make them water-resistant or provide specific desired sensitivity to water.

Textiles – leather
The acid-dyeing capability of polyacrylonitrile is improved by copolymerisation of the acrylonitrile with DMAE esters, such as dimethylaminoethyl acrylate.

Cellulose modified with the homopolymer of dimethylaminoethyl methacrylate can be dyed with ester salts of a leuco vat dye.

The impregnation of cellulose with polydimethylaminoethyl methacrylate also improves the gas-fading resistance of the fabric.

Long-chain alkylphosphates of DMAE form anti-static agents for non-cellulosic hydrophobic textile materials.

Paints, coatings and inks
DMAE is excellent for neutralising free acidity in water-soluble coating resins. The resin can be acrylic, alkyd or styrene-maleic. DMAE is often preferred to triethylamine when lower volatility is required, as in electrodeposition. It also improves pigment wettability.

Some synthetic enamels with a metallic appearance can be prepared from dimethylaminoethyl methacrylate polymers.

In flexographic inks DMAE can be used to solubilize resins and inoxes.

The adhesion of latex coatings can be improved by copolymerisation of the acrylic monomers with dimethylaminoethyl acrylate.

Surfactants – detergents
Alkylethanolamine salts of anionic surfactants are generally much more soluble than the corresponding sodium salts, both in water and oil systems. DMAE can be an excellent starting material in the production of shampoos from fatty acids. The fatty acid soaps are especially effective as wax emulsifiers for water-resistant floor polishes.

DMAE titanates, zirconates and other group IV-A metal esters are useful as dispersing agents for polymers, hydrocarbons and waxes in aqueous or organic solvent systems.

Typical Properties

Property	Typical Value, Units
General	
Molecular Formula	$C_4H_{11}NO$
Molecular Weight	89.14 g/mol
Appearance	Colorless liquid
Autoignition Temperature	230 °C
Boiling Point	134.1 °C
Critical Pressure	41 400 hPa
Critical Temperature	299 °C
Density @ 21.6°C	0.89 g/cm^3
Dissociation constant, pKa @ 20°C	9.3
Flash Point Closed Cup	40 °C
Freezing Point	-59 °C
Heat Capacity @ 20°C	2.485 kJ/kg·K
Heat of Combustion	3 215 kJ/kmol
Heat of Formation	-202 000 kJ/kmol
Heat of Vaporization	396.9 kJ/kg
Octanol-water partition coefficient, log Pow	-0.55
pH 100 g/l @ 20°C	10.5-11
Refractive Index @ 20°C	1.4294
Solubility in Water	Miscible
Surface Tension @ 20°C	28.2 mN/m
Thermal Conductivity @ 20°C	0.1537 W/m·K
Vapor Density (air = 1)	3.03

Vapor Pressure @ 28.1°C	10 hPa
Viscosity @ 21.6°C	3.584 mPa·s

Physical & chemical behavior

Amietol™ M21 (DMAE) is miscible in all proportions with water. It is also soluble in most organic solvents.

Chemically it is both a tertiary amine and an alcohol. Neutralisation of the amino function by acids results in salt formation.

The product is stable at high temperatures but must be kept away from oxidisers and acids.

Packaging

- Bulk
- Plastic drums (180 kg net)
- Steel drums (180 kg net)
- IBC containers (885 kg net)

Storage

Carbon steel is adequate for storage of DMAE.

Stainless AISI 316 L is preferable if color stability is to be maintained over a long period.

Copper and copper alloys should be avoided.

For bulk storage a nitrogen blanket is necessary to prevent the absorption of moisture and discoloration.

Comments

Properties reported here are typical of average lots. Eastman makes no representation that the material in any particular shipment will conform exactly to the values given.

3/5/2019 3:09:19 PM