Technical Information

Butyldiglycol

Description

Low-volatility, high-boiling, clear liquid with a mild odor. Solvent for numerous natural and synthetic resins, fats and oils. Feedstock for syntheses.

Chemical nature

Diethylene glycol monobutyl ether, 2-(2-butoxyethoxy)ethanol

Molecular formula	$C_8H_{18}O_3$
Molar mass	162.23g/mol
CAS number	112-34-5
EC number	203-961-6

Delivery specification

Property	Value	Unit	Test method
Butyldiglycol	99.0 min.	%	GC-Method BASF
Water	0.1 max.	%	DIN 51777, Part1
Pt/Co color value (Hazen)	10 max.	-	DIN EN ISO 6271

Properties

Butyldiglycol is a clear, low-volatility, mobile liquid with a very faint, mild odor. It is miscible with many common solvents, e. g. aliphatic hydrocarbons, alcohols, ketones, aldehydes, ethers, glycols, glycol ethers and water. It may form peroxides if it comes into contact with atmospheric oxygen.

Physical data

The following physical data were measured in the BASF SE laboratories. They do not represent any legally-binding guarantee of properties for our sales product.

Property	Condition	Value	Test method
Boiling range	at 1013 hPa; 95 Vol.-%; 2 – 97 ml	228 – 232 °C	DIN 51751
Density	at 20 °C	0.952 – 0.956 g/cm^3	DIN 51757
Refractive index n_D^{20}		1.431– 1.433	DIN 51423
Solidification point		- 68 °C	-
Evaporation rate	ether = 1	approx. 3500	
Enthalpy of combustion (ΔH_C)	at 20 °C	2.29 kJ/kg	-
Enthalpy of vaporization (ΔH_v)	at boiling point	307 kJ/kg	calculated
Surface tension σ	at 30 °C	24.7 mN/m	-
Surface tension σ	at 50 °C	23.6 mN/m	-
Solubility in water	at room temperature	freely miscible	
Conversion factor: 1	$(cal/cm^3)^{1/2}$ = 2,0455	$(MPa)^{1/2}$	
Hansen solubility parameters		$\delta d = 16.0\ (MPa)^{1/2}$ $\delta p = 7.0\ (MPa)^{1/2}$ $\delta h = 10.6\ (MPa)^{1/2}$ $\delta t = 20.4\ (MPa)^{1/2}$	

T [°C]	Vapor pressure P [hPa]	Density r [g/cm³]	Thermal conductivity λ [mW/(m·K)]	Viscosity η [mPa·s]
0	0.0020	0.9708		
10	0.007	0.9620		
20	0.02	0.9531	162.8**	5.9
30	0.06	0.9442	161.2	
40	0.14	0.9351	159.6	3.3
50	0.3	0.9258	158.0	
60	0.7	0.9165	156.4	2.2
80	2.6	0.8974	153.2	1.5
90		0.8877	151.6	
100	8.4	0.8779	150.0**	
120	22.8	0.8579		
140		0.8374		
150	82.0			
160		0.8165		
180	238	0.7951		
200	443	0.7732		
220	773			
230	1001			
230.5	1013			
**	extrapolated			

Applications

Selected applications are given below.

By virtue of its very low volatility, Butyldiglycol has been widely accepted as a flow promoter for baking finishes, e. g. those derived from urea, melamine, phenol, or epoxy resin composite formulations. Proportions as low as 1 – 3 % suffice for a substantial improvement in levelling, but higher proportions are required for coil coating lacquers. Butyldiglycol can be used for much the same purpose in cellulose nitrate baking finishes.

Formulations for water-based baking finishes are easier to apply if they include Butyldiglycol. It reduces the tendency to blistering and improves levelling.

Other applications for Butyldiglycol are as follows:

- Component of moisture-set printing inks. In this application, allowance must be made for the fact that Butyldiglycol considerably swells natural or synthetic rubber rolls in the printing press.
- Component of surface cleaners, e. g. for degreasing metals.
- Component of cutting oils.
- Starting material for the production of plasticizers, e. g. by reaction with phthalic anhydride.

Component of foam extinguishants.

Storage & Handling

Butyldiglycol should be stored under nitrogen. The storage temperature must not exceed 40 °C and moisture are excluded. Under these conditions, a storage stability of 12 months can be expected.

As soon as the original packaging is opened, the liquid comes into contact with ambient air and this will cause the formation of large quantities of peroxides and their degradation products. Opened containers should therefore be used up as quickly as possible.

It is recommended to use nitrogen blanketing for bulk storage tanks. Only dedicated storage tank and unloading facilities should be used.

Safety

When using this product, the information and advice given in our Safety Data Sheet should be observed. Due attention should also be given to the precautions necessary for handling chemicals.

Note

The data contained in this Technical Information is based on our current knowledge and experience as well as our investigations according to the today's state-of-the-art. In view of the many factors that may affect processing and application of the Product, these data do not relieve processors from carrying out their own investigations and tests; neither do these data imply any guarantee of certain properties, nor the suitability of the Product for specific purpose. No liability of BASF can be derived therefrom. It is the responsibility of the recipient of the Product to ensure that any proprietary rights and existing laws and legislation are observed.

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