

1,3 Butylene Glycol



Chemical names:	1,3-Butylene Glycol
Synonymous names:	1,3-Butanediol
CAS No.:	107-88-0
EINECS No.:	203-529-7
INCI name:	Butylene Glycol
CTFA name:	Butylene Glycol
CN Code:	290539 2000

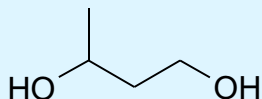
Producer: KYOWA HAKKO CHEMICAL Co., Ltd.



Kyowa Hakko Europe GmbH
Daiichi Fine Chemical Division

SPECIFICATION

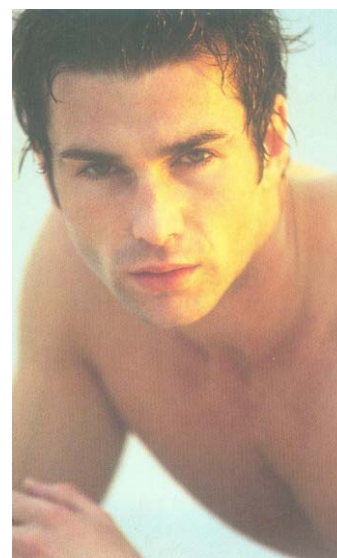
Chemical Structure:



Molecular Formula:	C ₄ H ₁₀ O ₂	
Molecular weight:	90.1	
Appearance:	Clear liquid	
Color:	not more than 10	(method: JIS K 0071)
Specific Gravity:	1.004 - 1.007	(method: JIS K 0061)
Water content:	not more than 0.5 %	(method: JIS K 0068)
Distillation test I.B.P.:	not less than 200°C	(method: JIS K 0066)
Distillation test D.P.:	not more than 215°C	(method: JIS K 0066)
Free acid (as acetic acid):	not more than 0.005%	(method: JIS K 0070)
Purity:	99.5 %	(method: JIS K 0114)

Other Physico-Chemical Properties

Boiling point:	207.5°C
Specific gravity:	1.006
Melting point:	-77 °C
Refractive index (n_D^{25}):	1.439
Viscosity (25°C):	104 mPa·s
Flash point (open cup):	115 °C
Vapor density (air=1):	3.1 °C
Explosion limits:	1.9 - 12.6 Vol%
Ignition point:	377 °C
Solubility (water 20°C):	completely soluble
Specific heat (20°C):	210.5 J/mol·K
Surface tension (25°C):	3.78 x 10 ⁻⁴ N/cm



Storage and Packing

Storage: Tighten the cap of container and store in a cool, dry, well ventilated storage area of cabinet

Standard-packing:	Iron drum	200 Kg
	ISO-Container	20 MT

Safety

Generally, the innocuousness of 1,3 Butylene Glycol as a skin contact substance has been described in many publications. It is tolerated practically without irritation, even over longer periods of time. The CIR panel concludes, that 1.3 Butylene Glycol in the concentration usually applied in cosmetics can be recognized as safe.

Acute toxicity LD50 (oral)	rat:	18.610 mg/Kg
		29.4 ml/kg Kg /other literature source
	mouse:	12.980 mg/Kg
No-effect level:		1500 mg/Kg

Functions

1,3 Butylene Glycol is a solvent and in general an alternative whenever Propylene Glycol or Glycerol are used with mostly superior properties both with regard to its technological properties as well as biological effects.

Technological functions

1,3 Butylene Glycol is a viscosity decreasing component. Like other humectants, it forms a barrier which prevents the drying out of cosmetics.

Furthermore, it prevents the assimilation of water from atmospheres of high humidity into film-forming preparations. Butylene Glycol prevents crystallization of insoluble components in cosmetic vehicles.

Moreover, it aids in solubilising aqueous insoluble ingredients. It has a solubilising effect on natural and synthetic flavouring substances. Among the most important characteristics of this ingredient are its ability to stabilise volatile compounds such as fragrances and flavours fixing them in cosmetic formulations and to retard the loss of aroma.



Biological functions

Butylene Glycol contributes to the preservation of cosmetics against spoilage by micro-organisms. Firstly, it has a very good distribution coefficient and thus leads to a better efficacy of preservatives mixed into formulation, thus making it possible to lower the dose of the applied preservative. Secondly, it has an anti-microbial effect itself.

Compared with Glycerol, Sorbitol, and Propylene Glycol, 1,3 Butylene Glycol is the most efficient polyol as antimicrobial agent. It inhibits gram-positive and gram-negative microorganisms as well as molds and yeasts, but is not sporicidal.

All polyols need a contact period of at least one week in order to exert their effect as preservatives. Butylene Glycol develops the best antimicrobial effect when e.g. added to an oil in water emulsion at a concentration of approximately 8 percent.

In tests Butylene Glycol has been shown to have inhibiting effects on the growth of *Escherichia coli*, *Salmonella typhiosa* and *Pseudomonas aeruginosa*, whereas fungi will be inhibited only at concentrations of more than 17 percent.

Literature

Shelanski, Cosmet. Perfum. 89, Nr. 9, 96, 1974
Harb. Et al., Drug, Cosmet. Ind. 118, Nr. 5, 40, 1976
Cramer et al., Food, Cosmet. Toxicol: 16, 255, 1978
Elder, J. Amer. Coll. Toxicol. 4, Nr. 5, 223, 1985

The data submitted in this publication are based on our current knowledge and experience. They do not constitute a guarantee in the legal sense of the term and, in view of the manifold factors that may affect processing and application, do not relieve those to whom we supply our products from the responsibility of carrying out their own tests and experiments. Any relevant patent rights and existing legislation and regulations must be observed.



Kyowa Hakko Europe GmbH
Daiichi Fine Chemical Division

Am Wehrhahn 50
40211 Düsseldorf/Germany

Tel: 0049 (0)211 - 175 45 0
Fax: 0049 (0)211 - 175 45 447

e-Mail: dfc@kyowa.de
Website: www.kyowa.eu/daiichi