Technical Information

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Propylene Glycol

USP, Ph. Eur.

Low-volatility, water-miscible, odourless solvent of very high purity; particularly suitable for applications in cosmetics

Fine chemicals

BASF

Chemical nature

1,2-propanediol	$CH_3–CH(OH)–CH_2OH$
Molecular formula:	$C_3H_8O_2$
CAS Reg. No.:	57-55-6
CFTA name:	Propylene Glycol

Specification

Identification (IR)	matches reference spectrum
Purity (capillary GC)	min. 99.5%
Density at 20 °C	1.035–1.037 g/ml
Refractive index n_D^{20}	1.431–1.433
Acid value	max. 0.03 mg KOH/ml
Water (Karl Fischer)	max. 0.2%
Sulfated ash	max. 70 mg/kg
Chloride	max. 70 mg/kg
Sulfate	max. 60 mg/kg
Oxidizing substances (Ph.Eur.)	passes test
Reducing substances (Ph.Eur.)	passes test
Dimers and polymers (capillary GC)	max. 0.1%
1,3-Propanediol	max. 100 mg/kg
Organic chlorine compounds as Cl	max. 1 mg/kg
Arsenic	max. 3 mg/kg
Heavy metals	max. 5 mg/kg

The methods of determination are to be found in the monographs in the pharmacopoeias. The methods for the determination of purity and acid value are available from us on request.

Propylene Glycol meets the purity requirements of the current USP and European Pharmacopoeia monographs and the German additives regulations.

Properties

Propylene Glycol is a clear colourless viscous liquid of low volatility with a boiling range of 184–189 °C. It is odourless, neutral and hygroscopic. It is miscible in all proportions with water, lower alcohols, esters and ketones.

Propylene Glycol is a germicide of approximately equal strength to ethanol. In solutions it suppresses the growth of microorganisms, the concentration required depending on the species, though generally 15–30% Propylene Glycol in the solution achieves the desired effect.

Applications

Propylene Glycol is specially manufactured as a high-purity, odour-free grade to meet the requirements of the cosmetics industry. Some of its applications are listed below.

Propylene Glycol is used

- in the manufacture of mouthwashes, toothpastes, ointments, skin creams, shampoos and perfumes (solutions of the ingredients for these products in Propylene Glycol usually remain clear even when they are highly diluted with water);
- as a preservative in cosmetic products in the form of emulsions;
- as a solvent for fragrances;
- as an extractant for active principles from natural products;
- as a solvent for water-soluble vitamins;
- as a lubricant for machines, e.g. in the cosmetics industry.

Storage

It is recommended to store Propylene Glycol in containers of stainless steel or aluminium. We advise against the use of galvanized containers.

It is important to prevent contact with air, e.g. by storing under a blanket of dry nitrogen. This precaution prevents any significant deterioration, even on prolonged storage. If atmospheric oxygen is not excluded, peroxides may be formed, which, in turn, may decompose into aldehydes and acids, spoiling the product.

Smaller containers should be kept tightly closed and stored in a well ventilated place.

Safety Data Sheet

	Guide value	Test method
Flash point		
Pensky-Martens	103 °C	DIN 51758
Ignition temperature	410 °C	DIN 51794
Explosion limits in air	**Volume fraction**	
Lower limit	2.6 %	
Upper limit	12.6 %	

Safety Data Sheet

A Safety Data Sheet conforming to DIN 52 900 is available for Propylene Glycol.

Toxicology

Propylene Glycol has been toxicologically assessed for its suitability in cosmetic preparations.

On the basis of information at our disposal and provided that the recommended concentrations and fields of application are adhered to, there is no evidence of any toxicological risks associated with its use. We will gladly supply details of the investigations on request.

Note

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 processors from the responsibility of carrying out their own tests and experiments. Any relevant patent rights and existing legislation and regulations must be observed.

BASF Aktiengesellschaft
Unternehmensbereich Feinchemie
D-6700 Ludwigshafen

BASF

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