
Technical Information

Lupasol® P

Multifunctional cationic polyethyleneimine for the
Detergents and Cleaners Industry.

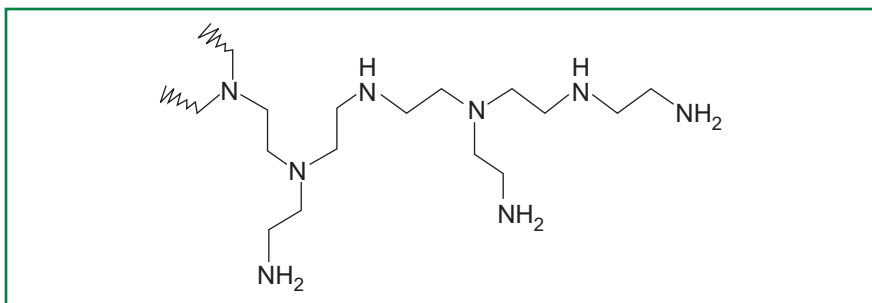
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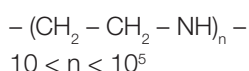
® = Registered trademark of BASF in many countries.

Nature

Lupasol® P is a multifunctional cationic polyethyleneimine (PEI) with a branched polymer structure.



Its composition is expressed by the following general molecular formula:



The nitrogen to carbon ratio in polyethyleneimines is 1:2, so that they have the largest possible amino group density of all known commercial polyamines. Polyethyleneimines have a definite ratio of primary, secondary and tertiary amino groups.

PRD-Nos.*

30048284

*BASF's commercial product numbers.

Appearance

Lupasol® P is a clear, colorless to yellowish liquid.

Handling and Storage**Handling**

- Lupasol® P should be stored in the tightly sealed original containers in cool, dry rooms.
- High temperatures and direct sunlight can lead to discoloration and the formation of surface films.
- At temperatures below 0 °C, the product may solidify, but brief heating to a maximum of 80 °C and stirring reverses the process.
- Prolonged exposure to atmospheric oxygen can cause discoloration. We therefore recommend storage under an inert atmosphere of nitrogen.
- Please refer to the latest Safety Data Sheet for detailed information on product safety.

Shelf life

Lupasol® P has a shelf life of at least 12 months, provided it is stored in its original packaging and kept tightly sealed.

Materials

Suitable materials for containers are stainless steel and numerous plastics (e. g. PE, PP and PVC). Containers of low alloy steel, copper or copper alloys cause discoloration and are therefore unsuitable.

Properties

Some physical properties are listed in the table below. These are typical values only and not all of them are monitored on a regular basis. They are correct at the time of publication and do not necessarily form part of the product specification. A detailed product specification is available on request or via BASF's WorldAccount: <https://worldaccount.basf.com> (registered access).

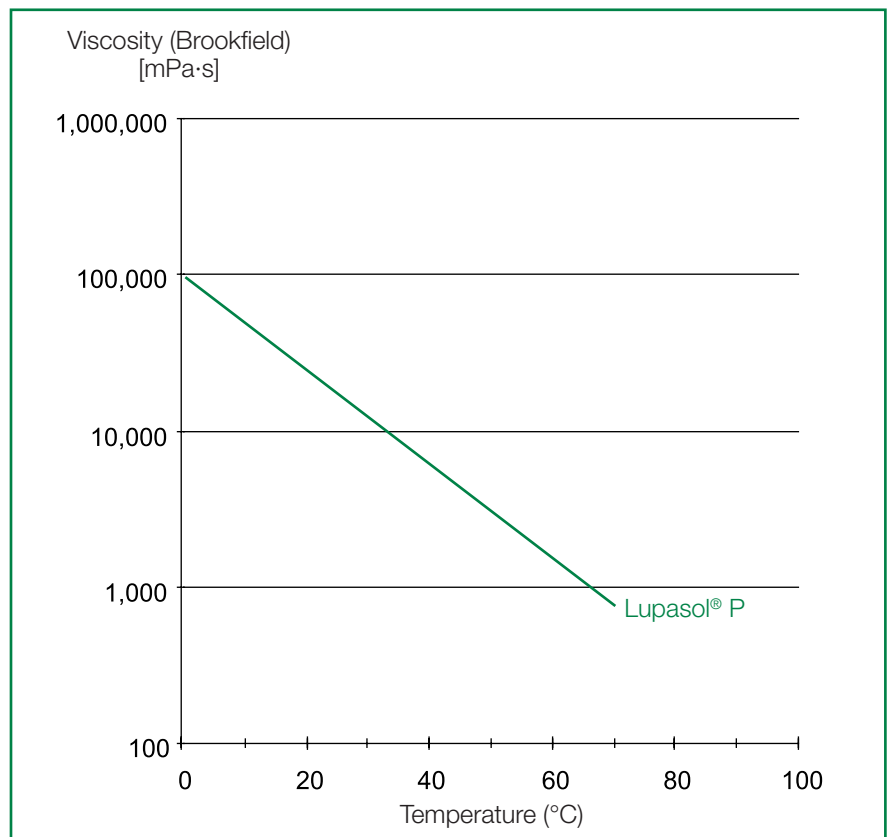
Lupasol® P is a polyethyleneimine in aqueous solution and is miscible with water in all proportions.

Lupasol® P	Unit	Value
Average molar mass (GPC, BASF method)	g/mol	750 000
Viscosity (ISO 2555, Brookfield)	mPa·s	25 000
Concentration (ISO 3251)	%	50
Water content (ISO 760, K. Fischer)	%	50
Refractive index (DIN 51423, 20 °C)		1.452
pH value (DIN 19268, 1% dry substance in dist. H ₂ O)		11
Density (DIN 51757, 20 °C)	g/cm ³	1.09
Charge density (cationic) ¹⁾	meq/g DS	17
Monomeric Ethyleneimine (BASF method)	ppm	<0.1
Pour point (ISO 3016)	°C	-3
Ratio of prim./sec./tert. amine (BASF method, ¹³ C NMR)		1/1/0.7
Amine value (BASF method)	mmol/g DS	18

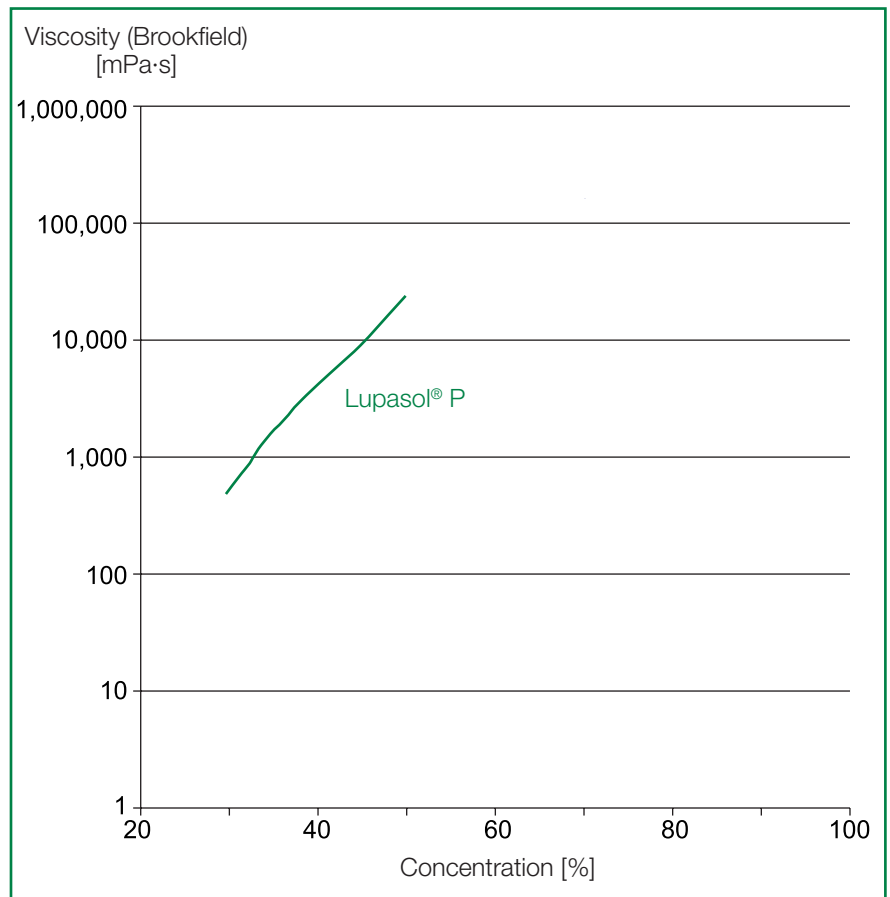
1) BASF method, 100% dry substance at pH 4.5

Viscosity

It is important for the transport, storage and processing of Lupasol® P to know how its viscosity changes with temperature and concentration. The graph below shows the viscosity of Lupasol® P as a function of temperature.

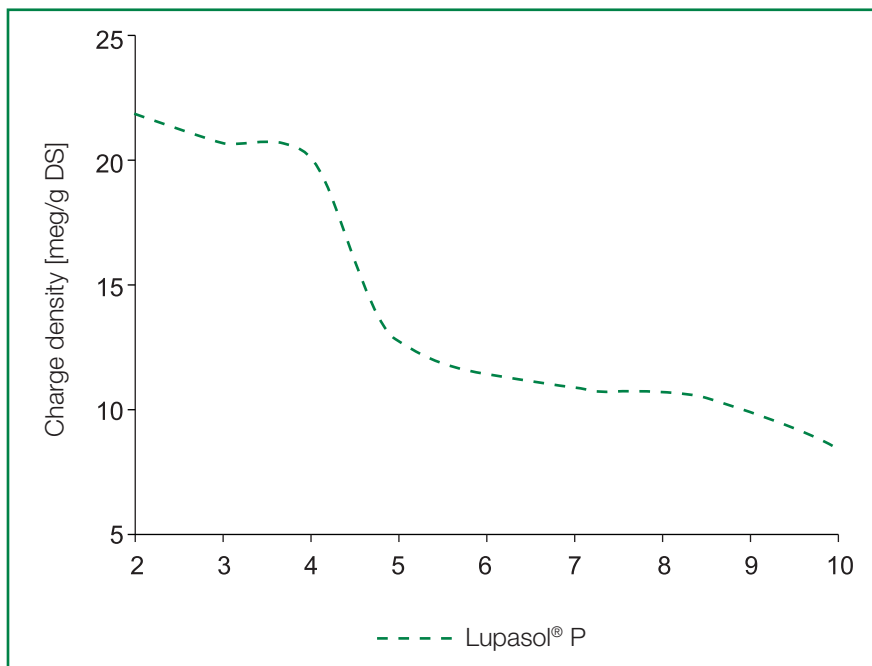


The following graph shows how the viscosity of Lupasol® P, depending on the water content.



Charge density

The charge density of Lupasol® P is shown here as function of pH.



Solubility

Lupasol® P is soluble in water and polar solvents.

The following solubility data are of a general nature only and can vary according to the amount of Lupasol® P to be dissolved. Aldehydes, ketones and chlorinated hydrocarbons are unsuitable as solvents, since they are likely to react with Lupasol® P. With acids, typical neutralization reactions occur.

Distilled water	+
Methanol ethanol, n-propanol isopropanol	+
n-Hexane	-
Ethyl acetate	-
Toluol Xylol	-

+ = *soluble*

- = *insoluble*

O = *partially soluble*

Compatibility

Lupasol® P is compatible with cationic and nonionic systems. In anionic systems, the addition of Lupasol® P can result in incompatibilities (gelatinization, precipitation). The compatibility can generally be improved by selecting the appropriate molecular weight or by adding ammonia.

Lupasol® P may change the coloristic properties of dyes and pigments.

Safety and Labelling

Please refer to the safety data sheet for information on classification & labeling, safe use, handling and transport.

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