

Protectol® GA types

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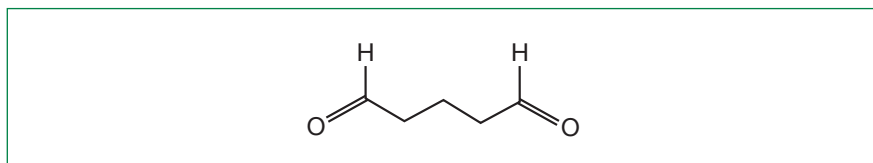
Protectol® GA 24

Protectol® GA 50

For use in disinfectants

Chemical name 1,5-pentanedial

Structural formula



Chemical information

Molecular formula C₅H₈O₂
Molar mass 100.1 g/mol
CAS-No. 111-30-8
EINECS-No. 203-856-3

PRD-Nos.*

30059034 Protectol® GA 24
 30136889 Protectol® GA 50

* BASF's commercial product numbers.

Storage and stability

Bulk (and other packaging types)

The Protectol® GA types have a half life of up to 12 months when stored in tightly sealed containers below 25 °C.

Moreover it is possible to improve storage stability of partial packages by careful reclosure and previous overlay with inert gas.

Do not store at temperatures above 40 °C.

Properties

Synonyms

Glutaral
 Glutardialdehyde

Colorless to slightly yellow liquids.

	Unit	Protectol® GA 50	Protectol® GA 24
Concentration (% w/w in water)	%	50.0 – 51.0	23.5 – 24.5
Methanol content (% w/w)	%	≤0.1	≤0.1
Specific gravity (20 °C)		approx. 1.13	approx. 1.06
Viscosity (cSt at 25 °C)	cSt	approx. 12.75	approx. 2.26
pH value (DIN 19268)		3.2 – 4.2	3.2 – 4.2

The above information does not necessarily form part of the product specification. A detailed specification is available from your local sales office.

Solubility and miscibility

Miscible in all proportions with water and a range of polar solvents such as methanol, ethanol and propanol.

Materials compatibility

Glutaraldehyde aqueous products have a comparable corrosivity to water at the same pH value. These products are acidic (pH 3.2 to 4.2) and therefore only materials which are sufficiently resistant towards acids should be used to avoid damage to equipment and products.

Compatible

- Baked Phenolics
- Fibreglass-reinforced plastics
- Glass
- Nickel
- Nickel-Chromium-Molybdenum Alloys
- Polyethylene
- Polypropylene
- PVC
- Stainless Steel types 304, 304L, 316 and 316L
- Titanium

Incompatible

- Aluminium
- Carbon Steel
- Copper
- Copper-Nickel Alloy
- Iron

Natural and synthetic rubber materials (e.g. Viton) can swell when get in contact with glutaraldehyde products and should therefore not be used.

Special care should be taken when choosing gasket materials. The use of incompatible materials may lead to product leakage or material failure. Polytetrafluoroethylene (PTFE) is recommended for all gaskets.

Stainless steel, glass and high density polyethylene (HDPE) should be considered where appropriate for storage containers.

Trace metal content

Analysis of a representative number of batches has shown that the trace metal contamination is less than 20 ppm in the product.

Dilute solution

Studies have been carried out to determine the effect of the pH value on the stability of dilute solutions of glutaraldehyde.

The study below shows that the stored solutions are most stable at acidic pH value. With increasing alkalinity, biocidal effect increases in the short term but will decrease in the long term (see also figure 2).

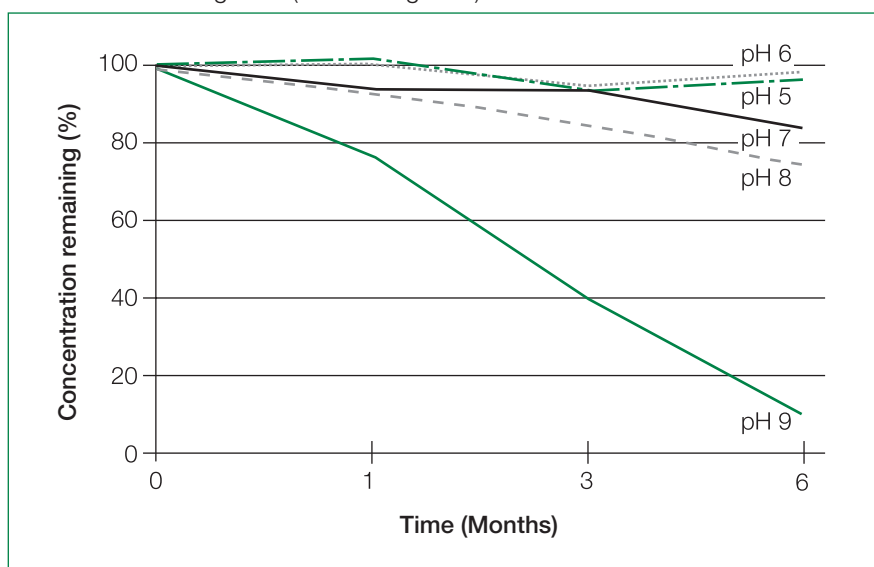


Figure 1: The Effect of the pH value on the stability of a 125 ppm aqueous solution of glutaraldehyde (~22 °C)

A similar trial carried out at 40 °C shows that the degradation of solutions stored at pH 7 and above is rapid. At acidic pH value, however, the solutions remained stable throughout the duration of the test.

In some applications the rapid disappearance of active glutaraldehyde, caused by high pH values and/or temperatures may be advantageous in reducing the impact on the environment.

Antimicrobial activity

BASF's glutaraldehyde products are highly effective antimicrobial agents, being active against a broad range of microorganisms including Gram positive and Gram negative bacteria, fungi, bacterial spores, algae and viruses.

Efficacy testing of Protectol® GA 50 using EN1040 and EN1275 criteria. (BASF report No.TD 051635)

Test	Organism	Contact time (minutes)	Minimum effective concentration (ml/l)
EN1040	<i>Pseudomonas aeruginosa</i>	5	2.0
		30	1.0
EN1040	<i>Staphylococcus aureus</i>	5	10
		30	≤1.25
EN1275	<i>Candida albicans</i>	5	10
		30	5.0
EN1275	<i>Aspergillus niger</i> (spores)	5	>320
		30	320

With increasing alkalinity, biocidal effects increase as shown in a time-kill study with bacterial spores (see figure 2).

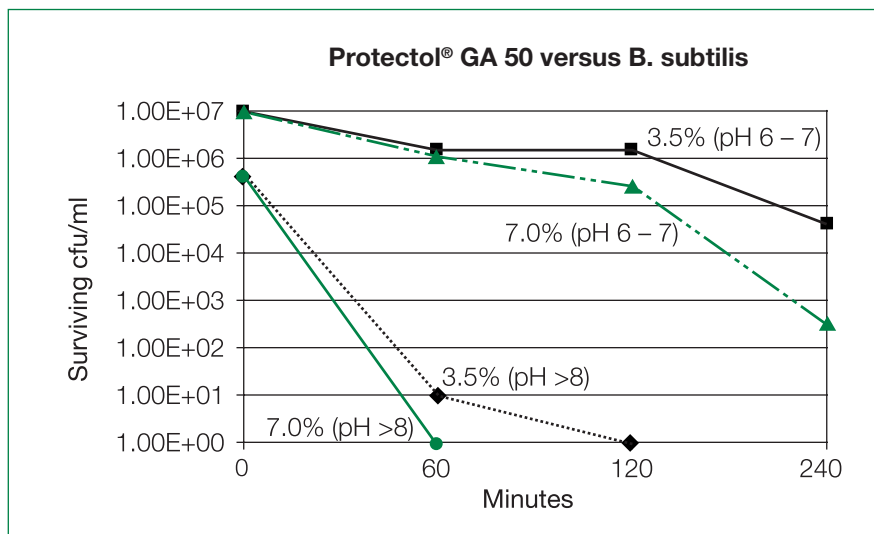


Figure 2: The effect of the pH value on the activity of Protectol® GA 50 against spore-forming B subtilis.

Antimicrobial mode of action

The activity of glutaraldehyde is reported due to its reaction with nucleophilic cell components, where it forms irreversible cross-links with proteins and enzymes, ultimately resulting in cell death.

Glutaraldehyde exhibits excellent antimicrobial activity, demonstrating a rapid speed of kill, however in the presence of protein, higher concentrations of glutaraldehyde may be required.

MIC values for glutaraldehyde

The Minimum Inhibitory Concentrations (MIC) for glutaraldehyde are not valid since glutaraldehyde can react with the media components used in the MIC tests. As a result, the figures obtained are generally higher than the effective doses required in-use.

Usability

BASF's glutaraldehyde products are suitable for use in a wide variety of application areas, such as surface and instrument disinfection, in-can preservation, microbiological control of industrial processes (e.g. water treatment, oil and gas exploration) and odor control/chemical toilet sanitation.

Further information concerning the use of the glutaraldehyde products are available on request from your local sales offices.

Stability in formulations

The high quality of BASF's glutaraldehyde products leads to improved stability, particularly in formulated alkaline activated solutions commonly used as instrument disinfectants.

Clear, dilute solutions can be formulated from Protectol® GA 50 which, following activation, remain clear for at least 4 weeks.

The results of in-house studies prove the high quality of Protectol® GA 50. When stored for extended time periods or at raised temperatures, the quality was found to be superior to that of alternative market products as clear solutions could still be produced following activation.

Where 50% glutaraldehyde solutions from any source are exposed to elevated temperatures, problems may be encountered with the formulation of stable instrument disinfectants. Glutaraldehyde supplied for use in these types of products should be stored at a maximum temperature of 20 °C, but, more ideally, at 6 °C. The general shelf life of twelve months at a maximum temperature of 30 °C only guarantees that the specified parameters are still fulfilled at the end of this time.

Registrations and approvals

Protectol® GA types are registered and approved in many countries throughout the world for use in a wide range of application areas.

Detailed information on product safety and the regional registration status is available on request

Safety

Toxicological and environmental data

See Material Safety Data Sheets.

Safety notes

According to the experience gained over many years and to other information at our disposal, the glutaraldehyde products supplied by BASF should not exert any harmful effects on health. This is provided that they are used properly, that due attention is given to safety and industrial hygiene precautions necessary for handling chemicals and that the information and advice given in our Safety Data Sheets are observed.

Handling and storage

Contact with eyes and skin should be avoided. Safety goggles must be worn when handling the concentrated product. Take care to avoid the generation of aerosols. Glutaraldehyde should be stored at ambient temperature in sealed containers as supplied, in dry conditions.

Labelling

Refer to the latest Safety Data Sheet for detailed information on product safety

Classification according to UN criteria

See Material Safety Data Sheets.

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