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Product Information

Geogard™ 221

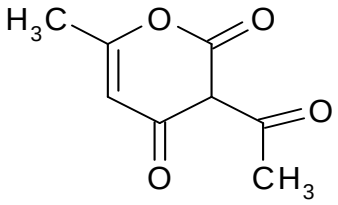
Globally approved preservative for cosmetics and toiletries. Accepted under Natural and Organic cosmetics standards of Ecocert as well as Soil Association.

Global Approval (including Japan).

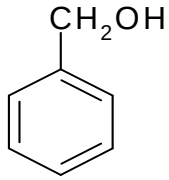
Broad Spectrum Activity.
Excellent Toxicity Profile.
Not tested on Animals
Permitted by Ecocert, as synthetic preservative in ecological and organic certified cosmetics.

1. Active matter

Dehydroacetic Acid (DHA)



Benzyl Alcohol



1.1 CAS No.: (Dehydroacetic Acid) 520-45-6
(Benzyl Alcohol) 100-51-6
1.2 EINECS No.: (Dehydroacetic Acid) 208-293-9
(Benzyl Alcohol) 202-859-9
1.3 UN No.: not applicable
1.4 INCI-Name: Dehydroacetic Acid
Benzyl Alcohol

2. Specifications

2.1	Total active acid (DHA)	7.7 – 8.3 %
2.2	Total alcohol (Benzyl)	85.0 – 89.0 %
2.3	Color (Gardner)	10 max.
2.4	Clarity	Clear

3. Properties

3.1	Appearance	Colorless to yellow liquid
3.2	Water	5 %
3.3	Activity	95%
3.4	Odor	mild
3.5	Density (20℃)	1.059
3.6	Flash point (Abel Pensky cc)	>96℃
3.7	Freezing point	≤ 1℃
3.8	Solubility	Highly soluble in polar organic solvents. Soluble in Water at low levels.

4. Registrations

% Geogard™ 221 and the End–Use Levels of the Individual Components

Preservative	CAS	Japan	Europe	Brazil	USA	Comments
Dehydroacetic acid	520-45-6	0.5	0.6	0.6	*	EU not allowed in aerosols
Benzyl alcohol	100-51-6	5	1	1	5	Japan - 0.2% Limit for eye area

Geogard™ 221 max use level: **1.15%** in Europe and Brazil, for leave-on and rinse-off formulations, excluding aerosols.

* = Safe as a cosmetic ingredient in the present practices of use and concentration.

5. Antimicrobial efficacy in challenge tests

Geogard™ 221 was incorporated into a shampoo formula, a glyceryl monostearate cream (GMS), and a cationic hair conditioner, all of them standard media used for efficacy studies.
Mix Bacteria : Pseudomonas aeruginosa, Escherichia coli, Staphylococcus aureus
Mix Fungi : Aspergillus niger, Candida albicans

Efficacy in the shampoo formulation :

Shampoo formula (Ingredients unpreserved)	%wt/wt.
Sterile DI Water	36%
Sodium lauryl ether sulfate	35%
Triethanolamine lauryl sulfate	25%
Cocomide DEA	3%
Hydrolyzed collagen	1%
Citric acid	<1%
pH 7.0	

% preservative (as supplied) required to achieve < 10 cfu/g of mix inocula in the shampoo

	Geogard™ 221	Competitor A	Competitor B
Bacteria			
Day 7	1.0	1.0	>1.0
Day 14	1.0	1.0	>1.0
Day 21	1.0	1.0	>1.0
Day 28	1.0	1.0	>1.0
Fungi			
Day 7	>1.0	1.0	>1.0
Day 14	>1.0	1.0	>1.0
Day 21	>1.0	1.0	>1.0
Day 28	>1.0	1.0	>1.0

Competitor A : *Phenoxyethanol; methylparaben; ethylparaben; propylparaben; butylparaben*
Competitor B : *Phenoxyethanol; methylparaben; isopropylparaben; isobutylparaben; butylparaben*

Efficacy in the GMS cream :

Non-ionic GMS cream (Ingredients unpreserved)	%wt/wt.
Sterile DI Water	75%
Myristyl propionate	8%
Glyceryl stearate	6%
Glycerin	5%
PEG-20 glyceryl stearate	4%
Cetearyl alcohol	1.5%
Sodium hydroxide	<1%
pH 6.	

% preservative (as supplied) required to achieve < 10 cfu/g of mix inocula in the GMS cream

	Geogard™ 221	Methylparaben	Methyl/Propylparaben 2:
Bacteria			
Day 7	0.25	0.6	0.6
Day 14	0.25	>0.6	>0.6
Day 21	0.25	0.6	0.6
Day 28	0.25	0.6	0.6
Fungi			
Day 7	1.0	0.6	0.6
Day 14	>0.8	>0.6	>0.6
Day 21	0.8	0.6	0.6
Day 28	0.8	0.6	0.6

Efficacy in the cationic conditioner :

Cationic hair conditioner formula (Ingredients unpreserved)	%wt/wt.
Sterile DI Water	90%
Laureth-4	3%
Cetyl alcohol	2%
Cetearyl alcohol	1.5%
Distearyldimonium chloride	1%
Hydrolyzed collagen	1%
Lecthin	1%
Polysorbate 80	0.5%
Sodium hydroxide	<1%
pH 4.5	

% preservative (as supplied) required to achieve <10 cfu/g of mix inocula in the conditioner

	Geogard™ 221	Competitor A	Competitor B
Bacteria			
Day 7	0.8	>1.4	>1.4
Day 14	0.6	>1.4	>1.4
Day 21	0.6	1.4	1.4
Day 28	0.6	1.0	1.4
Fungi			
Day 7	1.0	1.4	1.4
Day 14	1.0	>1.4	>1.4
Day 21	1.0	1.4	1.4
Day 28	1.0	1.0	1.4

6. Other investigations

Recommended use concentrations for different product types:

Product type	Concentration Geogard™ 221*
Creams type „organic“	1.15 % Geogard™ 221 or 0.5 % Geogard™ 221 + 0.2% Potassium Sorbate
Foaming Bath	0.6 - 0.8 %
Shampoo	0.8 - 1.0 %
Hair conditioner	0.4 - 0.5 %
Hand soap	0.6 - 0.8 %
Eye/Face Mask	1 % Geogard™ 221 (+ 0.2 Geogard™ 111S)
Body Lotion	0.6 - 0.8 %

*Recommended use concentration based on the Lonza‘s LSIME laboratory challenge test results data collection

7. Use areas

Geogard™ 221 can be used in a very diverse range of personal care applications. It is compatible with a wide range of formulating system. Examples include:

Hair Care	Shampoos, Conditioners, Rinses
Shaving	Lotions, Creams, Gels
Lotions	Body, Cleansing, Texture
Powders	Dusting, Bath, Beauty Masks, Makeup Base
Baby Products	Shampoos, Oils, Powders
Eye Makeup	Mascara, Eye Shadow, Eye Liner
Sun Products	Screens, Lotions, Oils
Creams	Cold Creams, Moisturizers, Hand and Foot
Raw Materials	Surfactants, Shampoos and Conditioner Blends

8. Heavy metal content

Sample N°	Batch Nr. M7435547
µg/g Co	< 0,5 ppm
µg/g Cr	< 0,5 ppm
µg/g Ni	< 0,5 ppm
µg/g As	< 0,5 ppm

Cr results confirmed via ICP/OES

9. Recommendations to formulate

Unique, easy-to-use and cost-effective, Geogard™ 221 is typically used at 0.2% to 1.0% of the final rinse-off or leave-on formulation. Geogard™ 221 is pH-sensitive and performs more effectively below pH 7.0. We recommend that Geogard™ 221 be added during the cool-down phase of the manufacturing process.
Geogard™ 221 may cause discoloration in certain products.

Compatibility
Geogard™ 221 can be used in a very diverse range of personal care applications.

Solubility
Geogard™ 221 is highly soluble in polar organic solvents and, to a limited extent, in water.

Stability:
Geogard™ 221 was shown to be still in specs after 7 months at 23°C and 2 weeks at 54°C.

Recovery of % Total acid (DHA) vs. Time and Temperature

Time	Temperature	DHA / Recovery
4 months	23°C	100%
7 months	23°C	96%
2 weeks	54°C	97%

10. Analytical procedure

Analytical methods to determine total active acid (DHA) and total alcohol (Benzyl) are available upon request.

11. Packaging / Storage

The product is supplied in plastic pails holding 20 kg net.
Geogard™ 221 can be stored for one year in the sealed original packaging normal temperature conditions. Geogard™ 221 may freeze below 0℃, but will resolubilize up on warming back to room temperature and stirring.

12. Regulatory information

refer to MSDS

13. Toxicological information

refer to MSDS

14. Ecological and Ecotoxicological Information

refer to MSDS