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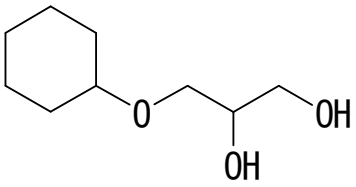
Date prepared: February/5/2014
Data revised : July/1/2016

ADEKA NOL CHG

ADEKA NOL CHG is novel glycol with bacteriostatic effect, high water solubility and lower skin irritation.



$C_9H_{18}O_3$: 174.23
CAS No. 10305-41-6

Appearance : Light yellow liquid
[Added 0.1% tocopherol as antioxidant]
Purity : >99%
Water solubility : Complete
INCI name : CYCLOHEXYL GLYCERIN

Minimal Inhibitory Concentration (MIC(μg/ml))

Test microorganism	MIC (μg/ml)			
	ADEKA NOL CHG	Phenoxyethanol	1,2-Hexanediol	Pentylene glycol
E.coli	**10000**	5000	10000	30000
P.aeruginosa	**15000**	5000	10000	20000
S.aureus	**30000**	10000	20000<	50000
B.subtilis	**20000**	10000	20000	50000
C.albicans	**10000**	5000	15000	25000 [1)]
Z.rouxii	**16000**	4000	No data available	No data available
A.brasiliensis	**10000**	2500	10000	20000 [1)]

1) Fragrance Journal 2006-4 p.39-

TEST MICROORGANISM:

BACTERIA
Escherichia coli ATCC 8739
Pseudomonas aeruginosa ATCC 9027
Staphylococcus aureus ATCC 6538
Bacillus subtilis IFO 3134

FUNGI
Candida albicans ATCC 10231
Zygosaccharomyces rouxii IFO 1876
Aspergillus brasiliensis ATCC 16404

Combination effect of CHG

CHG has a synergistic effect with a combination use of Caprylyl glycol and Ethylhexylglycerin.

Test microorganism	MIC（μg/ml）				
	Caprylyl glycol	**CHG：Caprylyl glycol（1：1）**	ADEKA NOL CHG	**CHG：Ethylhexyl glycerin（2：1）**	Ethylhexyl glycerin
E.coli	1300	**2500**	10000	**7500**	2500
P.aeruginosa	3800	**7500**	15000	**10000**	10000<
S.aureus	3800	**5000**	30000	**3800**	1900
C.albicans	2500	**3800**	10000	**3800**	1900
A.brasiliensis	<900	**1300**	10000	**<1900**	<900

Challenge test

Trial formula：Lotion		**Trial formula：Cream**	
Ingredient	**Amount(%)**	**Ingredient**	**Amount(%)**
SORBETH-30 TETRAOLEATE	4.0	TRIETHYLHEXANOIN	20.0
GLYCERIN	0.2	SORBETH-30 TETRAOLEATE	4.0
SODIUM ACRYLATES/C10-30 ALKYL ACRYLATES CROSSPOLYMER	0.1	CETEARYL ALCOHOL	0.2
Antimicrobial constituent	0～1.0	GLYCERIN	0.2
Water	to 100	SODIUM ACRYLATES/C10-30 ALKYL ACRYLATES CROSSPOLYMER	0.1
		Antimicrobial constituent	0～3.0
		Water	to 100

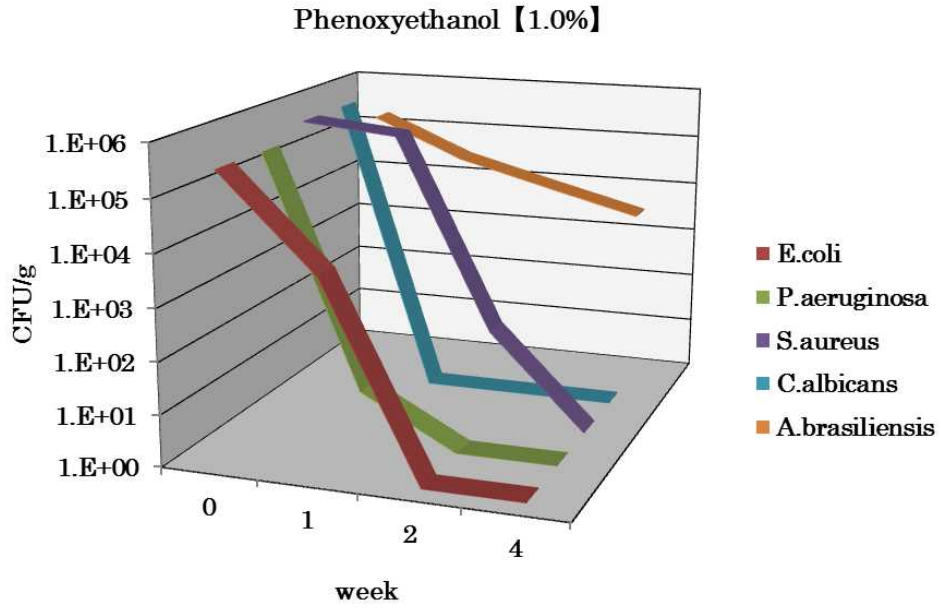
Criteria for evaluation

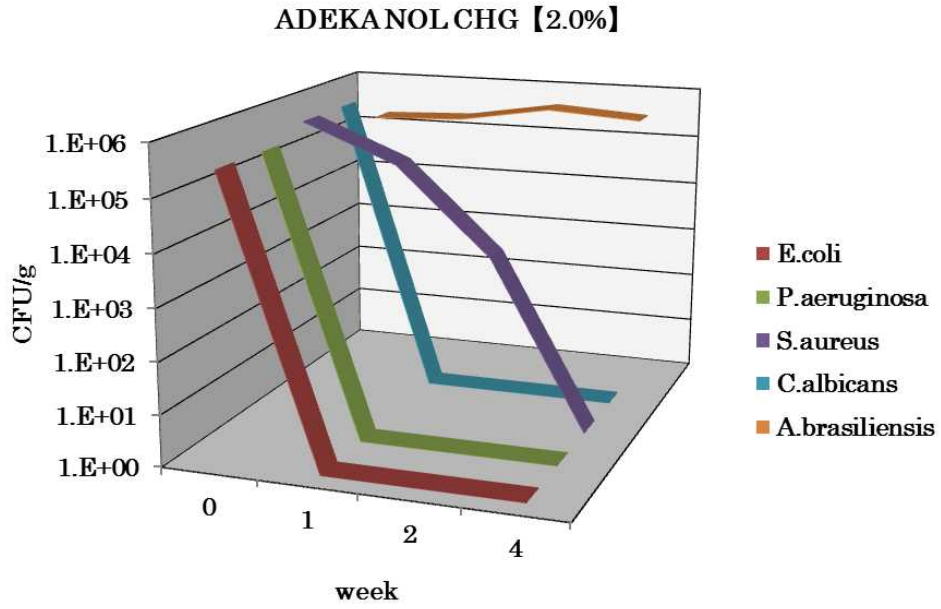
	Bacteria *C.albicans*	*A.brasiliensis*
14 days after	Less than 0.1% of the inoculum organism count	Less than blank and Inoculum organism count
28 days after	Less than or equal to the level after 14 days	Less than or equal to the level after 14 days

Effective concentration【Lotion】

	ADEKA NOL CHG	Methylparaben	Phenoxyethanol
E.coli	**2.0%**	0.6%	1.0%
P.aeruginosa	**1.0%**	0.4%	1.0%
S.aureus	**3.0%**	0.6%	1.0%
C.albicans	**2.0%**	0.4%	1.0%
A.brasiliensis	**3.0%<**	0.4%	1.0%

The effective concentration of CHG is at about 2.0% in aquatic lotion except mold.
CHG needs to combine with other ingredients to enhance an effect against mold.

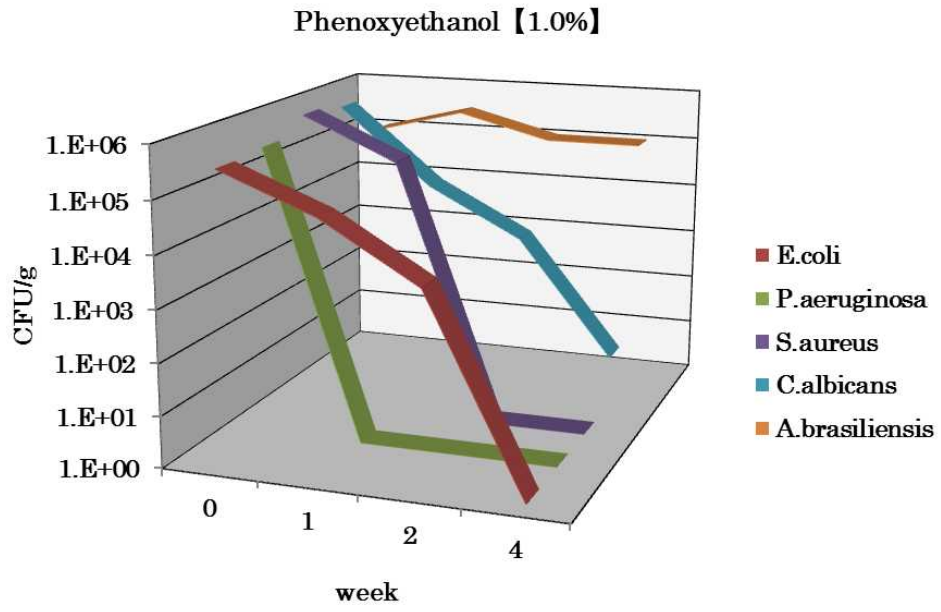


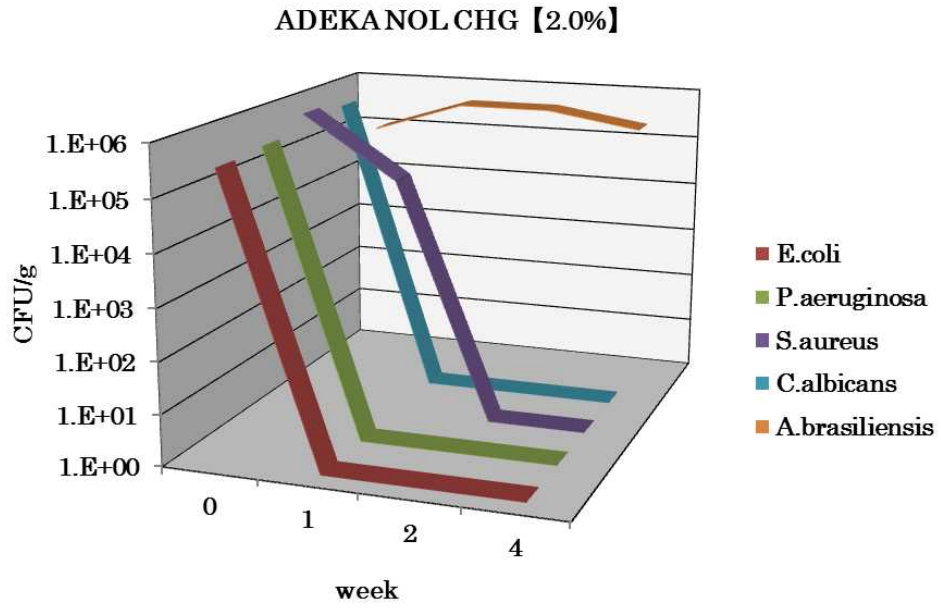


Effective concentration【Cream】

	ADEKA NOL CHG	Methylparaben	Phenoxyethanol
E.coli	**1.0%**	0.8%<	1.5%
P.aeruginosa	**1.0%**	0.6%	1.0%
S.aureus	**2.0%**	0.6%	1.0%
C.albicans	**2.0%**	0.8%	1.5%
A.brasiliensis	**3.0%**	0.6%	2.0%<

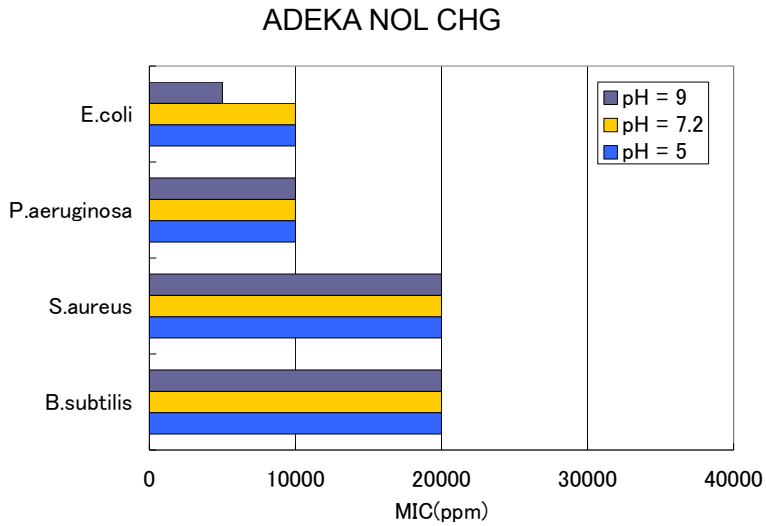
The effective concentration of CHG is at 2.0% in cream except mold.
The effective concentration of CHG is not affected by oily ingredients.

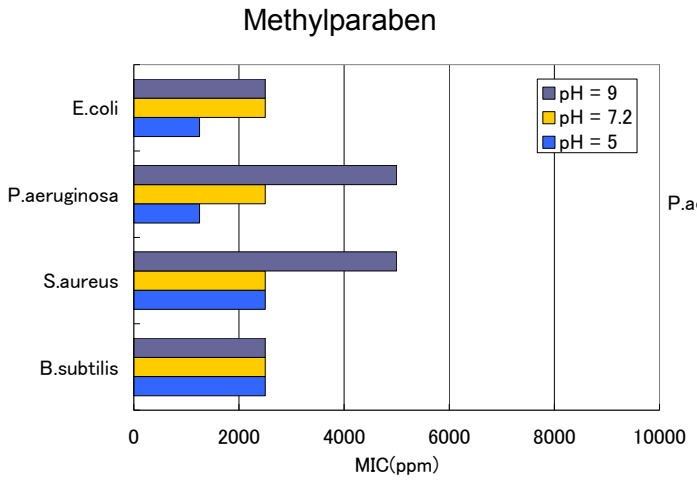


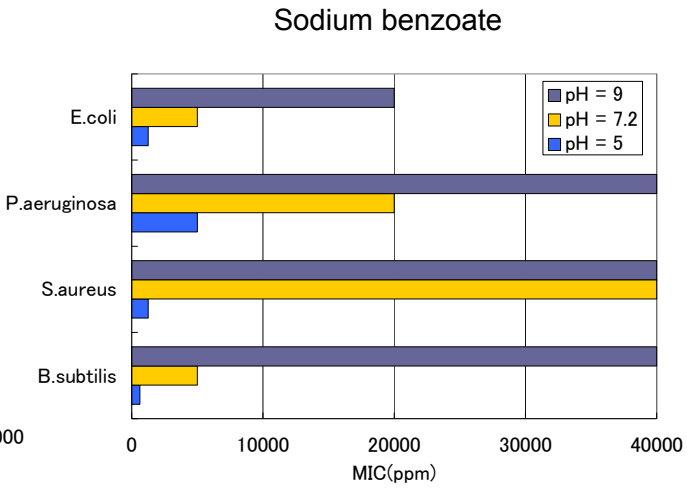


Effect of pH

CHG is not affected by pH because it is nonionic substance.



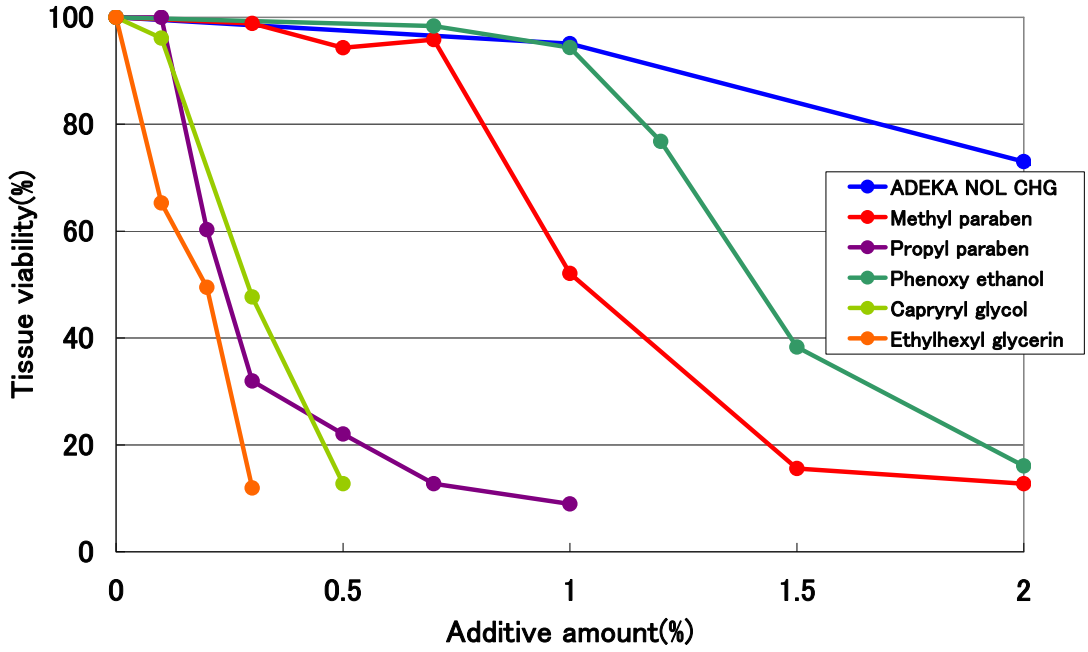




Skin irritation

The tissue treated by CHG keeps higher tissue viability. Therefore, it is expected that the skin irritation is very weak.

In vitro skin irritation test by reconstructed human cultured epidermal model



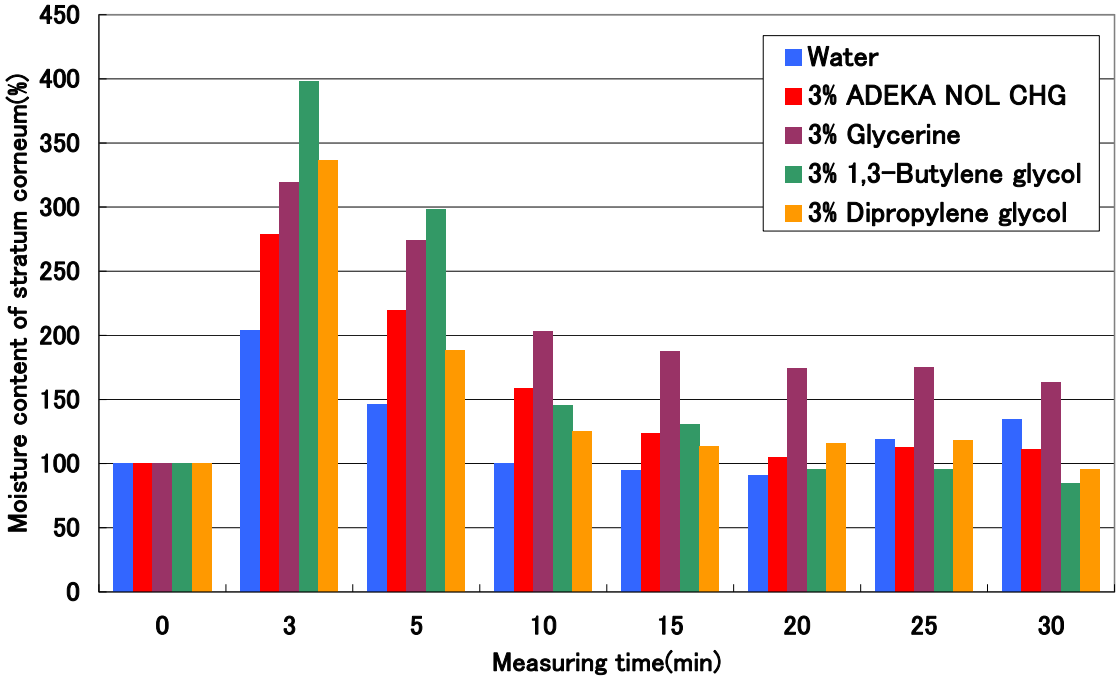
TEST METHOD : Reconstructed human cultured epidermal model used LabCyte EPI-MODEL (Japan Tissue Engineering Co., Ltd). The tissues were exposed to the test materials and incubated with the assay medium for 24 hr (37°C, 5% CO_2). Then, the tissues were transferred to MTT medium and incubated for 3 hr (37°C, 5% CO_2). The tissues were extracted with isopropanol (IPA) and absorbance was measured.

CALCULATING :

$$\text{Tissue viability (\%)} = \frac{\text{[Test material absorbance] – [IPA absorbance]}}{\text{[Reference absorbance] – [IPA absorbance]}}$$

Moisture-retaining property

CHG improves moisture-retaining property.



MEASURING CONDITION :
Measuring equipment : SKICON-200
Room air temperature : 22°C
Humidity : 50%

TEST METHOD : 1.5cm square filter paper containing 0.1ml test solution was worn on the skin on the inner side of arm for 5 min. Moisture content of stratum corneum was measured for 3, 5, 10, 15, 20, 25 and 30min after taking down filter paper.