

SynerCide Herbal Fusion

Technical Data Sheet

BACKGROUND

Advances in technology have allowed for the evolution of preservation techniques throughout the centuries. Some of the original approaches included dehydration and fermentation. Other traditional methods used for preservation have involved creating herbal tisanes. Of course today there is a need to preserve more than just food. Although some of the aforementioned techniques are still utilized, until recently, more popular methods for the preservation of cosmetics have been the use of ingredients such as parabens and phenoxyethanol. However as these ingredients have fallen out of favor with consumers, chemists have been striving to find effective alternatives.

SCIENCE

Active Micro Technologies has taken a unique approach by developing the SynerCide Fusion line of products, which are a fusion of traditional and more modern preservation techniques. These actives are intended to provide skin conditioning and hydrating benefits as well as inhibit microbial growth.

SynerCide Herbal Fusion consists of oregano, thyme and rosemary extracted in caprylyl and hexylene glycols. In this system, the glycols act as more than just a solvent as they are understood to provide emollient and humectant properties.

BENEFITS

Oregano is a widely recognized herb that is frequently used as an accent in a variety of Mediterranean cuisines. Traditionally used as an antiseptic, the botanical contains phytochemicals such as oleanolic and caffeic acids. These are capable of providing protection against oxidative stress which contributes to aging.

In addition to its culinary uses, thyme has been used medicinally to treat both infection and inflammation. Thymol, an essential oil in thyme was historically used on bandages before the advent of antibiotics. Long credited with improving one's memory, research has shown that Rosemary may actually enhance cognitive function while providing antioxidant protection. The herb is rich in carnosic, rosmarinic and caffeic acids. In addition to their health benefits, all three herbs possess potent antimicrobial benefits.

Code Number: M17002

INCI Nomenclature:

Hexylene Glycol & Caprylyl Glycol & *Origanum vulgare* Leaf Extract & *Thymus vulgaris* (Thyme) Leaf Extract & *Rosmarinus officinalis* (Rosemary) Leaf Extract & Water

INCI Status: Approved

REACH Status: Fully Compliant

CAS Number: 107-41-5 & 1117-86-8 & 84012-24-8 & 84929-51-1 & 84604-14-8 & 7732-18-5

EINECS Number: 203-489-0 & 214-254-7 & 281-670-3 & 284-535-7 & 283-291-9 & 231-791-2

Origin: Botanical:

Origanum vulgare & *Thymus vulgaris* & *Rosmarinus officinalis*

Processing:

GMO Free
No Ethoxylation
No Irradiation
No Sulphonation
No Ethylene Oxide treatment
No Hydrogenation

Additives: None

-Preservatives: None

-Antioxidants: None

Other additives: None

Solvents used: Hexylene Glycol & Caprylyl Glycol & Water

Appearance: Clear to Slightly Hazy Liquid

Soluble/Miscible: Fully Water Soluble

Suggested Use Levels: 1.0 - 2.0%

Suggested Applications:

Skin Conditioner, Antimicrobial

SynerCide Herbal Fusion

EFFICACY TESTING

SynerCide Herbal Fusion is useful in a variety of cosmetic and personal care applications as testing has revealed that it is a broad spectrum antimicrobial. Minimum inhibitory concentration (MIC) testing and a double challenge study confirm that **SynerCide Herbal Fusion** is effective against gram positive and gram negative bacteria, as well as yeast and mold.

Microorganism Tested	MIC (%)
<i>E. coli</i>	0.50
<i>S. aureus</i>	1.00
<i>P. aeruginosa</i>	0.50
<i>C. albicans</i>	0.50
<i>A. brasiliensis</i>	2.00

Figure 1. MIC data for **SynerCide Herbal Fusion**

	<i>S. aureus</i>	<i>E. coli</i>	<i>P. aeruginosa</i>	<i>C. albicans</i>	<i>A. brasiliensis</i>	<i>K. pneumoniae</i>	<i>B. cepacia</i>
Inoculum Level (initial)	2.17E+06	2.46E+06	2.25E+06	8.93E+05	2.86E+05	3.02E+05	2.04E+06
Day 0	49.44%	51.88%	107.25%	93.14%	89.96%	47.32%	>99.999%
Day 1	>99.999%	>99.999%	>99.999%	>99.999%	93.65%	>99.999%	>99.999%
Day 2	>99.999%	>99.999%	>99.999%	>99.999%	97.71%	>99.999%	>99.999%
Day 3	>99.999%	>99.999%	>99.999%	>99.999%	98.44%	>99.999%	>99.999%
Day 7	>99.999%	>99.999%	>99.999%	>99.999%	99.63%	>99.999%	>99.999%
Day 14	>99.999%	>99.999%	>99.999%	>99.999%	99.999%	>99.999%	>99.999%
Day 21	>99.999%	>99.999%	>99.999%	>99.999%	99.999%	>99.999%	>99.999%
Day 28	>99.999%	>99.999%	>99.999%	>99.999%	99.999%	>99.999%	>99.999%
Inoculum level (re-inoculated)	1.28E+06	2.69E+06	2.18E+06	7.19E+06	2.56E+05	1.34E+06	2.13E+06
Day 0	31.42%	45.38%	53.13%	34.89%	14.22%	27.37%	>99.999%
Day 1	>99.999%	>99.999%	>99.999%	>99.999%	98.37%	>99.999%	>99.999%
Day 2	>99.999%	>99.999%	>99.999%	>99.999%	99.61%	>99.999%	>99.999%
Day 3	>99.999%	>99.999%	>99.999%	>99.999%	98.74%	>99.999%	>99.999%
Day 7	>99.999%	>99.999%	>99.999%	>99.999%	99.90%	>99.999%	>99.999%
Day 14	>99.999%	>99.999%	>99.999%	>99.999%	99.999%	>99.999%	>99.999%
Day 21	>99.999%	>99.999%	>99.999%	>99.999%	99.999%	>99.999%	>99.999%
Day 28	>99.999%	>99.999%	>99.999%	>99.999%	99.999%	>99.999%	>99.999%

Table 2. Percent change in microorganism concentration for 2% **SynerCide Herbal Fusion** in an O/W emulsion

USE RECOMMENDATIONS

Optimal conditions for formulating with **SynerCide Herbal Fusion** include maintaining a pH between 3 and 8 and temperatures below 70°C. If formulating at higher temperatures, it is recommended to add the ingredient on cooling, even after an emulsion has been formed. Whether interested in enhancing epidermal hydration or replacing more conventional preservatives, using **SynerCide Herbal Fusion** allows formulators to develop contemporary products for the discerning consumer.