SunCaps™

Efficient and Safe Encapsulated UV Filters

Suncaps™ Formulation:

Phase	Ingredient	INCI Name	%
A	Zemea	Propanediol	4
	Deionized Water	Water	Add 100
B	Tween 20	Polyethylene glycol sorbitan monolaurate	8
	Span 20	Sorbitan monolaurate	3
	Gransurf W9	Cetyl PEG/PPG-10/1 Dimethicone & Hexyl Laurate & Polyglyceryl-4 Isostearate	3
	Gransurf 90	Cetyl PEG/PPG-10/1 Dimethicone	1
	Captex® 355	Caprylic/Capric Triglyceride	3
	Xiameter pmx-200 silicone fluid 10 cst	Dimethicone	4
	Dermosoft OMP	Methylpropanediol & Caprylyl Glycol & Phenylpropanol	1
C*	AvoCap	Butyl Methoxydibenzoylmethane (and) Octocrylene (and) Cellulose Acetate	5.3
	OctiCap	Ethylhexyl Salicylate (and) Cellulose Acetate	5.3
	OctoCap	Octocrylene (and) Cellulose Acetate	5.3
	HomCap	Homosalate (and) Cellulose Acetate	5.3
D	3% Pemulen™ TR-1 polymer Gel	Acrylates/C10-30 Alkyl Acrylate Crosspolymer	15

*Each SunCaps™ composing phase C is equivalent to 3% of free UV filter.

Phase C of the control formulation is composed from 3% of each of the free, non-encapsulated UV filters.

Manufacturing Procedure:

- Mix all the ingredients of Phase A and heat to 70°C.
- Separately, mix all ingredients of Phase B and heat to 70°C until completely dissolved.
- Gradually add phase B to phase A while continuous mixing using anchor type propeller mixer at 350rpm/70°C for 10 min.
- Mix all ingredients of Phase C in separate vessels.
- Gradually add phase C to AB while continuous mixing using anchor type propeller mixer at 350rpm/70°C for 10 min.
- Homogenize mixture ABC for 5 min at 70°C (12,000rpm).
- Gradually add phase D while homogenizing at 70°C/ 12,000rpm for 10 min.
- Continue mixing ABCD using anchor type propeller mixer at 350rpm /RT for 5 min.
- * for the control formulation, phase C is first completely dissolved in phase B and then added to phase A.

Formulation Guidelines:

To ensure a proper incorporation of SunCaps™ into base formulation it is recommended to:

- Add a dispersive/wetting agent to obtain an even dispersion.
- Add surfactants for reduction of the interfacial tension between SunCaps™ and the continuous phase.
- Homogenizer should be used.

To demonstrate the efficiency of SunCaps™, we compared the value of In-Vitro SPF between free Sunscreen formulations and SunCaps™ formulations as shown in Figure 1.

Formulations were placed on Transpore (3M) substrate at 2mg/cm2 and measurements were carried out using SolarLight SPF290AS equipment at wavelength range of 290-400nm.

In-Vitro SPF Results:

Figure.1. In-Vitro SPF results of a) formulation composed of free UV filters (Blue) and b) formulation incorporated with SunCaps (Orange). Both formulations contained a final concentration of 3% from each of the following UV filters: avobenzone, octocrylene, homosalate and octisalate (total UV filters %- 12).

Formulating a sunscreen formulation with SunCaps™ results in higher In-Vitro SPF value compared to free UV filters.

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