

Particle carrying properties under challenging conditions

Today's personal care and cosmetic products require the right rheological properties in order to enhance such products during production, storage (stability) and application. Rheology is defined as the science of flow and plays an important role in formulating products such as creams, lotions, shampoos and so forth.

Developing best-in-class cosmetic products comes with a good understanding of rheological requirements. Often a product needs to be poured out of a bottle whereas at rest it has to establish a stable suspension or emulsion. In such cases, pseudoplastic (or shear thinning) behavior is required. So it can be stated that formulations' rheological characteristics are important for production, packaging, filling and storage. Another attribute is consumers' sensation of a skin cream when applied (skin feel). Many more examples can be thought of, but in the end a rheology modifier will most often be required to reach respective goals.

Betafib® MCF is a unique, non-associative thickener that can help delivering discussed functionalities. It basically establishes a physical network that can carry particles and add viscosity when above mentioned product is at rest. Introduction of a little shear will disrupt this network and consequently, will transfer a gelled product into a liquid. Unlike many other rheology modifiers, Betafib® MCF does not require high viscosity to suspend (carry) particles of almost all kinds. Yet another unique property of Betafib® MCF is its wide operating window with respect to temperature stability, electrolyte stability and pH range.

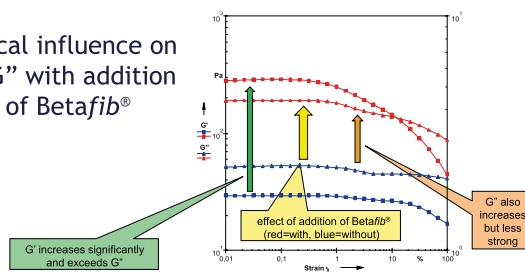


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The inert nature of Betafib® MCF is a result of Cosun's patented processing route. It continues delivering performance in various formulations and under challenging conditions, where most rheology modifiers fail. A good indication of Betafib®'s rheological behavior is reflected in the figure below in which the effect of structuring with Betafib® is demonstrated for anti-dandruff shampoo by rheology measurement.

Typical influence on G' / G'' with addition of Betafib®



- Conclusion: Addition of Betafib® improves both G' and G'' significantly
- G' exceeds G'' after addition of Betafib® → a liquid becomes a gel!

Extensive tests confirm the versatility of Betafib®. It was formulated into a wide variety of formulations (various surfactants, actives and particles were used as ingredients). Formulations in different pH ranges were prepared while Betafib® MCF kept performing.

Skin feel was confirmed positive by a selected test panel. Skin creams containing the Betafib® structurant could be applied easily. The test panel was very pleased with the organoleptic properties of the skin care formulations. Typical use levels range from 0.15 to 1.0% (expressed dry matter vs. the total mass of the formulation).

With a wide variety of products in the personal care industry, it was decided to narrow the testing down to three cases and investigate the actual benefits for the use of Betafib®. Each case represented a specific challenge: stabilizing an emulsion that was made with sunflower oil, stabilizing starch particles for a hybrid shampoo and stabilizing the considerable amount of hydrophobic powders in sun screen formulations. (See back side of this page for the framework formulations).

Framework formulations



'Biobased' Shampoo-conditioner formulation			
Phase	Ingredient	%W/W	Function
A	Plantacare 818	20	Degreaser
B	Lamesoft PO 65	4	Moisterizing
C	Reisita Natural	4	Absorbant and mild abrasive
D	Betafib® MCF - solid	2.8	Structurant; Stabilizes starch particles and prevent settling
E	Quatin® 350 TQ D	1.0	Conditioning (wet and dry)

Night cream formulation		
Phase	Ingredient	%W/W
A	Demi water	74.24
	Betafib® MCF - solid	3.2
	Glycerin	3.00
B	Sunflower oil	16.68
C	Eumulgin SG	0.50
	Emulgade PL 68/50	3.00
D	Glydant Plus	0.15
E	Citric acid	q.s.

Sun screen cream*/lotion*		
Phase	Ingredient	%W/W
A	Demi water	59.41
	Betafib® MCF - solid	3.2
B	Glycerin	5.00
	CETIOL® AB	6.00
	Sisterna PS750-C*	1.50*
	Sisterna L70-C*	3.75*
	Eumulgin SG#	0.50#
	Emulgade PL 68/50#	3.00#
C	LUVITOL® EHO	2.00
	Natura-Tec Ultrafeel ISIS 10-15	4.00
	Eusolex 9020	2.00
	Aakosun OCR	8.00
D	Aakosun TiO2	5.00
	Glydant Plus liquid	0.12
E	Dermofeel Toco 70 non GMO	0.05
	Acid or base	q.s.

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