



Formulating with Sulfate-Free Surfactants ACULYN™ Rheology Modifiers and METHOCEL™ Thickeners

For body washes and shampoos, there are two primary physical properties that are near and dear to the hearts of consumers – lather and viscosity. Beyond the cleansing performance, the quantity of overall foam, creaminess of the lather, wetting and spreading, and rinsability are key factors in consumers' experience with personal care cleansers. With regards to viscosity, body washes and shampoos should appear thick and viscous, as runny, watery products are unappealing to consumers and not marketable.

Over the past few years, the demand for sulfate-free products has been increasing, bringing new challenges to formulators. Indeed, non-sulfated surfactant systems tend to be more difficult to thicken, and thus, the choice of appropriate thickeners is important to achieve the desired viscosity expected by consumers while maintaining a reasonable cost.

ACULYN™ Rheology Modifiers and METHOCEL™ Thickeners enable formulators to achieve the desired thickness and flow properties in body washes and shampoos based on sulfate-free surfactant systems.



SAMPLE FORMULATIONS

Sulfate-Free Shampoo with Dead Sea Salt

ACULYN™ 22 is a high-performance rheology modifier, which enable the production of very cost effective, sulfate-free formulations.

Ingredients

Phase	Trade Name	% Wt.	INCI / CTFA Name	Supplier
A	Deionized Water	69.20	Aqua / Water	
	ACULYN™ 22 Rheology Modifier	4.00	Acrylates/Steareth-20 Methacrylate Copolymer	Dow Chemical
B	Tealan 99%	0.41	Triethanolamine	Rita Corporation
C	Chemccinate DSLS	16.00	Disodium Laureth Sulfosuccinate	Lubrizol
D	Tealan 99%	0.49	Triethanolamine	Rita Corporation
	Plantacare 2000	2.00	Decyl Glucoside	Cognis
	Lathanol LAL Flake	3.00	Sodium Lauryl Sulfoacetate	Stepan
E	Tealan 99%	0.60	Triethanolamine	Rita Corporation
	Chembetaine C	3.00	Cocamidopropyl Betaine	Lubrizol
F	Propylene Glycol	0.30	Propylene Glycol	Coast Chemical
	UCARE™ JR-400 Polymer	0.10	Polyquaternium-10	Dow Chemical
G	Tween 20	0.10	Polysorbate 20	Croda
	Mandarin Lily	0.05	Parfum / Fragrance	Custom Essence
H	Ultracolor Green#5	0.04	Green 5	Ultra Chemical
	Ultracolor Yellow#6	0.01	Yellow 6	Ultra Chemical
	Dead Sea Salt Crystals	0.60	Sea Salt	Dead Sea Labs
	KATHON™ CG Preservative	0.10	Methylchloroisothiazolinone/ Methylisothiazolinone	Dow Chemical

Processing Instructions

1. Combine Phase A while stirring.
2. Add Phase B while stirring slowly.
3. Add Phase C to Phase A/B and continue stirring.
4. Add Phase D to mixture from Step 3, stir until homogeneous and the Sodium Lauryl Sulfoacetate is dissolved.
5. Add Phase E, one ingredient at a time, with stirring.
6. Premix Phase F and add to batch with stirring.
7. Premix Phase G and add to batch with stirring.
8. Add Phase H, one ingredient at a time, with stirring.
9. Adjust pH to within range with triethanolamine.

Sulfate-Free Body Wash Formulation

METHOCEL™ 40-0202 Thickener is an essential ingredient in a sulfate-free system. Thanks to its surface activity provided by dual hydrophobic and hydrophilic groups, METHOCEL™ 40-0202 is not only compatible with these novel surfactant types, but also provides excellent lather enhancement, foam boosting and helps *deliver a creamy and luxurious foam*.

Ingredients

Phase	Trade Name	% Wt.	CTFA / INCI Name	Supplier
A	Deionized Water	39.25	Aqua / Water	
	METHOCEL™ 40-0202 Thickener	1.15	Hydroxypropyl Methylcellulose	Dow Chemical
B	Calinate LE	32.00	Disodium Laureth Sulfosuccinate	Pilot Chemical
	Caltaine C-35	11.50	Cocamidopropyl Betaine	Pilot Chemical
	Caloxamine LO	6.00	Lauramine Oxide	Pilot Chemical
	Calamide O	2.50	Cocamide DEA (and) Oleamide DEA	Pilot Chemical
C	Calamide MC	2.00	Cocamide MEA	Pilot Chemical
	ACULYN™ 60 Rheology Modifier	0.50	PEG-150 Distearate	Dow Chemical
D	Ethylene Glycol Distearate	0.70	Ethylene Glycol Distearate	
E	Sodium Chloride	4.00	Sodium Chloride	
F	DMDM Hydantoin	0.30	DMDM Hydantoin	
	Fragrance	0.10	Parfum / Fragrance	

Processing Instructions

1. In main beaker, add the deionized water and disperse the METHOCEL™ 40-0202 Thickener by sprinkling it in with propeller agitation. Once the METHOCEL™ 40-0202 is completely dispersed, adjust the pH above 8.0 with any base material to fully hydrate the polymer. Solution should be viscous and crystal clear.
2. Heat the METHOCEL™ 40-0202 Thickener solution, with continued mixing, to 75-80°C.
3. Add Phase B ingredients, one ingredient at a time, with continued mixing and heating, waiting for uniformity and mixture to reach 75°C before adding the next ingredient.
4. Add Phase C ingredients with mixing and heat to 80°-85°C, allowing materials to dissolve completely.
5. Add Ethylene Glycol Distearate and mix until dissolved and uniform. Allow to mix 15 minutes at this temperature.
6. Add the Sodium Chloride with continuous mixing.
7. Remove heat and begin to cool.
8. At 40°C, add the DMDM Hydantoin and Fragrance. Mix until uniform.
9. Cool to room temperature.
10. Adjust pH using citric acid or Triethanolamine (whichever is appropriate) to pH 7.0-7.5.

Interested in Learning More?

For more information on ACULYN™ Rheology Modifiers, METHOCEL™ Thickeners or other products offered by Dow Personal Care, please contact us at the numbers listed below:

From the United States and Canada

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