Application note – High viscosity cleaners from Ampho HAC Multi, Ampho HC 80 and Rheo2Green2

There are many instances where altered rheology, in most cases thickness, plays a vital role for product performance. We at AmphoChem frequently get inquires on how to alter rheological properties of a cleaner.

No matter what the task there are certain technologies that work, and we frequently work with either self-thickening surfactant systems or polymer-based thickeners. The biggest draw back of the surfactant based self-thickening systems is their limitation in window of operation. This means that they are easily disturbed by either other components as well as altered parameters such as pH and even temperature. When they work they are very useful!

Polymers on the other hand, depending on their actual chemical nature, are more tolerant towards changes in composition and often applicable over a range of pH values and salt concentrations.

Product examples

Ampho HAC Multi, Bermocoll Thickened

The thickened Ampho HAC Multi is developed to present prolonged chemical action on vertical surfaces. The hygroscopic properties of the Bermocoll allows the cleaner to retain moisture (not dry up) and at the same time the thickness and viscoelastic properties provided present a layer which presents sufficient cleaning power even for tough to clean surfaces.

Formulation*:

1%	Ampho HAC Multi
1%	Dissolvine GL-47S
0.6%	Bermocoll EBM 10000

Optionally preservative. *Balance with water

Procedure: Bermocoll is dispersed in water. Ampho HAC Multi is added to the slurry. Dissolvine GL-47S is added under heavy stirring to prevent lump formation as the elevated pH of Dissolvine GL-47S activates the Bermocoll EBM 10000 (Procedure important to avoid gel particle formation).

Ampho HC 80, Bermocoll Thickened

The thickened Ampho HC 80 is developed to serve as a base for industrial hand soap, with addition of abrasive material. This is for removing oil and grease from hands. Depending on the exact desired aesthetic properties of the soap the Bermocoll can be varied to present various rheological properties. Below is one example:

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Formulation*:

5%	Ampho HC 80
5%	Dissolvine GL-47S
2.5%	Bermocoll EBS 451 FQ

Citric acid for pH adjustment
Optionally preservative. *Balance with water

Procedure: Mix the Dissolvine GL-47S in water (a calculated portion) and adjust to the desired pH using Citric acid (recommended pH 8). Monitor total weight. Disperse the Bermocoll in the remaining water (calculated from above) and add Ampho HC 80. The Dissolvine GL-47S mixture is added under heavy stirring to prevent lump formation as the elevated pH of Dissolvine GL-47S mixture activates the Bermocoll EBS 451 FQ.

Note: Depending on the actual pH the swelling of the Bermocoll takes more or less time. However, complete swelling takes hours and until the gel thickness is stable. If the desired pH is below 8, then some heating and/or longer time is required.

Rheo2Green2, activated
Rheo2Green2 is a sulphate free, easy to use, formulation that is self-thickening upon pH-adjustment. This product is used to produce very mild, sulphate free, hand soaps, shampoos, pet care products and more.

Formulation*:

33%	Rheo2Green2

Citric acid for pH adjustment
Optionally preservative. Optionally Dissolvine GL-47S for increased performance and Ca^{2+}/Mg^{2+}-control. *Balance with water

Procedure: Mix the Rheo2Green with water. Add Citric acid (in this case as is, i.e. powder), until the optimal pH is reached. Optimal pH is 4.8-4.9 for maximum thickness. In this case it took 2 grams of Citric acid (on top of the base recipe) to achieve optimal pH and resulting thickness.

Note: The correct surfactant structures are formed within a specific pH-window. This window is 4.7<pH<5.0, with an optimum at 4.8-4.9. This means that "over titration" results in viscosity loss. A weak acid such as Citric acid is recommended.

For inquires or further information please contact your sales representative.

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