Carbopol® Aqua CC Polymer: The Premier Cationic Compatible Rheology Modifier for Low pH Formulations

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Abstract

Every year, formulators of personal care products are challenged to further differentiate their products in an effort to attract new consumers. This has led to efforts to target more clearly defined individual consumer market segments and to the development of specialized formulations to address more sophisticated consumer needs.

In many cases, high performance formulations are designed to deliver enhanced conditioning for hair or skin through the use of cationic ingredients, the delivery of actives, or the use of ingredients offering anti-aging benefits at low pH levels. Traditionally, these challenging formulations have limited the choice of rheology modifiers which can be used. Typical anionic thickeners may not be well suited in a low pH or cationic containing environment, and non-ionic options may provide undesirable aesthetics.

Now, Carbopol® Aqua CC polymer, the newest member of the Carbopol® polymer family, overcomes these limitations and creates new formulating possibilities. This premier cationic compatible liquid rheology modifier was specially designed for use in low pH personal care applications where low to medium viscosity is desirable. This patent-pending new polymer offers high clarity, a smooth feel and excellent suspension capabilities, properties for which Carbopol® polymers have long been the preferred choice in other applications.

Its cationic compatible nature enables formulators to take advantage of ingredients such as cationic conditioners or pH-sensitive actives which offer improved sensory and conditioning properties without sacrificing product aesthetics. This makes it ideal for use in clear conditioning shampoos, bath gels, facial cleansers, conditioning styling applications and hair conditioners.

Further, in surfactant-based applications with a pH under 6.0, the polymer offers a unique Back-Alkaline Thickening mechanism which makes it possible for formulators to tailor rheology to suit their specific needs. Carbopol® Aqua CC polymer is supplied with 20% solids in an easy-to-use, low viscosity liquid emulsion form.

The unique features of this exciting new polymer truly create new possibilities for today's formulators. These benefits will be demonstrated.

Background

Formulations having an acidic pH, (i.e., pH <6.0), containing cationic components, such as cationic surfactants and salts thereof or active acidic components are commonly referred to as "low pH" formulations. These ingredients are commonly chosen for formulations used to treat or condition the hair and skin. They can be found in shampoos and cleansing products, creams and lotions, and gels.

Stable low pH viscous emulsion and gel formulations are often difficult to obtain. Traditionally, the most commonly used thickeners are synthetic associative thickeners, which are frequently anionic in charge and hence are typically incompatible with cationic components, especially quaternary ammonium salts. They can also be ineffective thickeners at low pH.

As a result, the formulator of low pH compositions, especially emulsions, has a limited choice of either nonionic thickeners, such as nonionic surfactants, or cationic thickeners. Nonionic thickeners are uncharged and thus are assumed to be less reactive, but nonionics tend to inactivate preservatives and in some cases promote microbial growth. While some cationic polymeric rheology modifiers, such as hydrophobically modified aminoacrylate copolymers, are available commercially, their rheological properties are unpredictable or aesthetically unsatisfactory.

Thus, there is an ongoing need and desire for a cationic compatible polymeric rheology modifier for use in low pH formulations.