Ultragel 300 – a Novel Cationic Polymer for Rheology Control in Hair and Skin Care Preparations

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Abstract

Ultragel 300 (Polyquaternium-37) is an innovative, powder grade thickener/rheology modifier, which has been designed specifically to produce a sparklingly transparent solution in water or water/alcohol blend.

Ultragel 300 aids suspension and stabilisation of non-ionic and cationic co-ingredients and has multifunctional attributes within personal care formulations. Because of its cationic nature, Ultragel 300 performs over a wide pH range and is ideal for cold process formulations. It is not suitable for use in formulations containing anionic ingredients. Solvent tolerance is exceptional, particularly ethanol, propylene glycol and acetone thus making it highly suitable as a viscosifier for most solvent containing formulations. A patent application has been filed.

Introduction

Cationic polymers are substantive to skin and hair and thus are used widely in personal care formulations for their conditioning properties and for generating the very desirable sensory perception characteristics of soft and silky feel. Most commercially available cationic polymers are either low or medium molecular weight and are supplied in aqueous solution form. As molecular weight is increased, solution properties become very viscoelastic and solids contents have to be reduced in order to overcome handling problems. If crosslinking is introduced to reduce the viscoelasticity, the products are in gel form which also causes handling problems.

During the 1990's, technology was developed via liquid suspension polymers (LSP) and inverse emulsion (IE) techniques eg Rheocare CTH(E) to deliver high molecular weight, highly cross-linked, water swellable, microparticles, dispersed in non-aqueous carriers which rapidly self-emulsify in water to yield highly viscous, pseudoplastic, opaque gels.

The synthesis of Ultragel 300, which complements the LSP range of products, involved the complete elimination of the components in the LSP and IE polymerisation processes which create the opaque solution properties, yet retains the pseudoplastic rheological properties. This innovative technology directly answers the demand from personal care product marketing departments for a cationic thickener with the rheology properties of LSP types but with excellent optical transparency.

Ultragel 300 has not only been accepted for use in crystal clear formulations but also as the preferred thickener/rheology modifier for creams and lotions due to its excellent spreading properties and superior 'non-tacky' and rich feel characteristics when used in skin care formulations.

UltraGel 300 – An Effective Thickener and Rheology Modifier

The chemical composition of Polyquat – 37 is shown in Fig 1 and the typical properties of Ultragel 300 are listed in Fig 2.

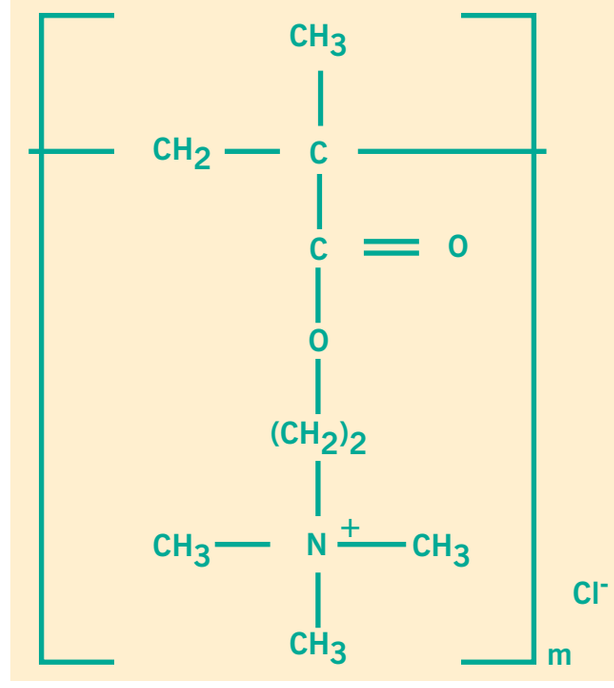

Fig 1. Chemical formula of Polyquat – 37. Dimethyl Amino Ethyl Methacrylate Polymer (DMAEMA)