

Precipitation Polymers

Gemagique™ HP – Ammonium Polyacryloyl Dimethyl Taurate

Gemagique™ HPS – Ammonium Polyacryloyl Dimethyl Taurate

Gemagique™ CP1 – Ammonium Acryloyl Dimethyl Taurate/VP Copolymer

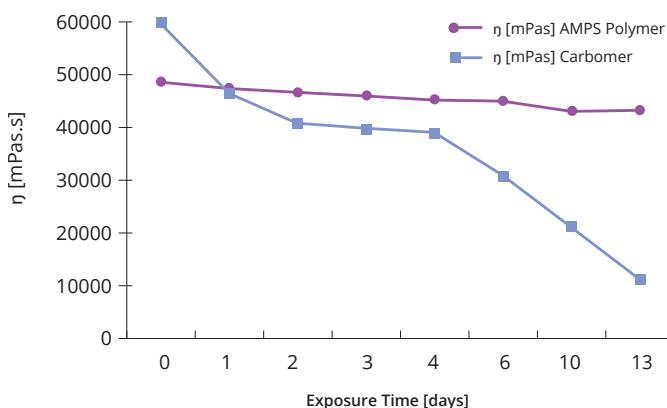
Gemagique HP, Gemagique HPS and Gemagique CP1 are synthetic AMPS based polymers used as gelling agents for aqueous systems and as texturizers and thickeners for oil-in-water (O/W) emulsions. The polymers are preneutralized, easy to use, and provide formulations with excellent yield value, corresponding to superior stability even in the absence of additional emulsifiers.

Emulsions formulated with Gemagique HP and Gemagique CP1 provide favorable shear thinning effects and viscoelastic properties. Besides the rheological aspects, they provide excellent sensory properties (low degree of stickiness/tackiness). Based on a polymer backbone derived from sulfonic acid, O/W emulsions can be formulated even at low pH, enabling easy incorporation of e.g. AHA's (α -hydroxy acids).

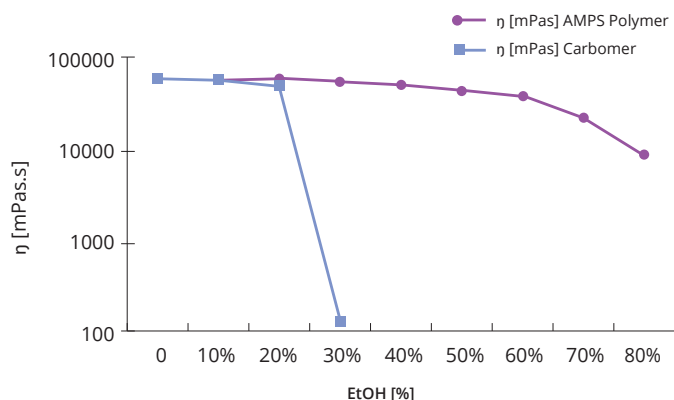
Gemagique HP, Gemagique HPS and Gemagique CP1 are compatible with organic solvents (ethanol, isopropanol, acetone) and are stable towards UV radiation and high shear stress. The amount of Gemagique HP and Gemagique CP1 used in personal care formulations is typically in the range of 0.5 - 1.2%. Compared to the commonly used carbopols and carbomers the performance of Gemagique HP and Gemagique CP1 is outstanding.

Besides their high UV light stability both also show high stability in alcohol concentrations >80%.

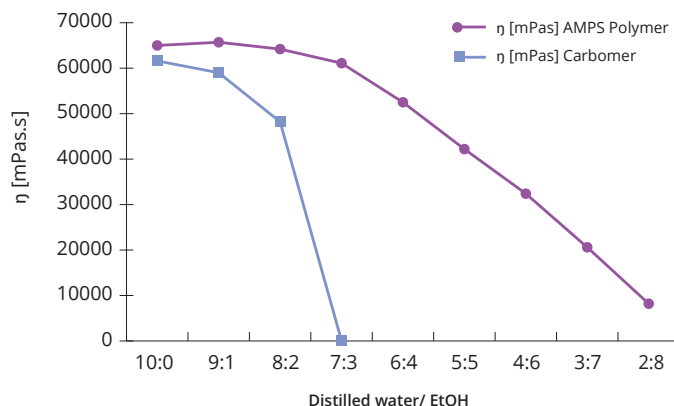
Viscosity of 1% aqueous polymer solutions after exposure to UV light (366nm, 420 μ W/cm²) – Brookfield viscometer, 20 rpm, 20°C



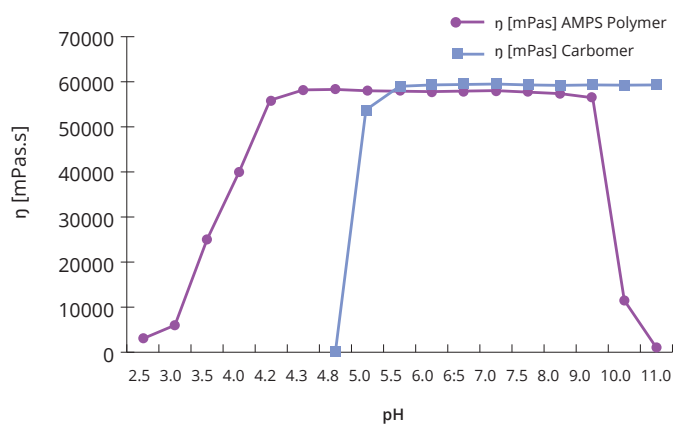
Viscosity of 1% aqueous polymer solutions in EtOH/water mixtures – Brookfield viscometer, 20 rpm, 20°C



Thickening Properties of 1% aqueous polymer solutions in EtOH/water mixtures – Brookfield viscometer, 20 rpm, 20°C



Thickening Properties of 1% aqueous polymer solutions in EtOH/water mixtures – Brookfield viscometer, 20 rpm, 20°C



UNIQUE BENEFITS

- Multifunctional viscosity modifier for O/W and W/O emulsions
- Forms homogeneous, transparent gels with water and water-soluble organic solvents
- Stable viscosity profile from pH 3.5–9.0
- Excellent sensory feel, smooth, light, cool and non-sticky
- Emulsifier-free formulations with up to 20% oil feasibility
- EO-free
- Ready to use (pre-neutralized)
- UV light tolerance
- Cold-process capable
- Stable in high alcohol concentrations >80%

APPLICATIONS

- Cosmetics (lotions, creams, anti-aging gels, face cleaning gels, hair gels, sun care, sun protection gels, hair wax, facial toner)
- Home care (hand sanitizers)

Facts About Gemagique HP

Chemical Composition	Polymeric sulfonic acid, neutralized
INCI	Ammonium Polyacryloyl Dimethyl Taurate
CAS No.	62152-14-1
Appearance	White to off-white powder
Solid Content	Min. 93%
pH (1% aq. solution, 20°C)	4.5 – 6.5
Recommended usage level	0.3 – 1.0% w/w
Viscosity (1% in dist. water)	> 40000 mPas

Excellent compatibility with water and most water-soluble organic solvents
Easy to formulate, pre-neutralized, high shear stability
Excellent UV light stability
Excellently suitable in O/W and W/O emulsions as well as hydrogels

Facts About Gemagique HPS

Chemical Composition	Polymeric sulfonic acid, neutralized
INCI	Ammonium Polyacryloyl Dimethyl Taurate
CAS No.	62152-14-1
Appearance	White to off-white powder
Solid Content	Min. 93%
pH (1% aq. solution, 20°C)	4.5-6.5
Recommended usage level	0.3 – 1.0% w/w
Viscosity (1% in dist. water)	> 6000mPas

Excellent compatibility with water and most water-soluble organic solvents
Easy to formulate, pre-neutralized, high shear stability
Excellent UV light stability
Ideal for hand sanitizer formulations

Facts About Gemagique CP1

Chemical Composition	Polymeric sulfonic acid, neutralized
INCI	Ammonium Acryloyl Dimethyl Taurate/VP Copolymer
CAS No.	335383-60-3
Appearance	White to off-white powder
Solid Content	Min. 93%
pH (1% aq. solution, 20°C)	4.0 – 6.0
Recommended usage level	0.3 – 1.0% w/w
Viscosity (1% in dist. water)	> 40000 mPas

Excellent compatibility with water and most water-soluble organic solvents
Easy to formulate, pre-neutralized, high shear stability
Excellent UV light stability
Excellently suitable in O/W and W/O emulsions as well as hydrogels

Preparation of Emulsions

Gemagique HP and Gemagique CP1 can be used to prepare O/W emulsions in both hot (max 45°C) and cold processes. Gemagique HP and Gemagique CP1 are always added to the oil phase (comprising emollient and emulsifier); slight agitation facilitates dispersion. Any small aggregates can be broken up easily via gentle stirring. The mixing reactor should be completely free of moisture to prevent the polymer from migrating prematurely to any water already present and becoming rubber-like.

Gemagique HP and Gemagique CP1 can be used for both direct emulsification (i.e. adding the oil phase to the water phase) and inverse emulsification (i.e. adding the water phase to the oil phase). As Gemagique HP and Gemagique CP1 are pre-neutralized, no neutralization step is required. Finally, the emulsion is homogenized with high shear mixing equipment. Emulsions comprising Gemagique HP and Gemagique CP1 are brilliant and glossy, providing excellent spreadability and fast absorption. The O/W emulsions are characterized by dry aesthetic feel without tackiness and are especially suitable as light, elegant formulations.

Preparation of emulsifier-free cream-gels

Another special feature of Gemagique HP and Gemagique CP1 is the stabilization of water-insoluble liquids (e.g. oil) without using additional emulsifiers. The resulting O/W formulations are also known as pseudo-emulsions. Using Gemagique HP and Gemagique CP1, emulsifier-free cream-gels can be formulated, opening the door to novel, modern formulations with special rheological profiles (creamy, non-sticky/tacky) and superior skin compatibility.

The resulting compositions are light and creamy, differing greatly from the gelatine-like appearance typically achieved when formulating with 'traditional'

thickeners. The stabilizing effect of Gemagique HP and Gemagique CP1 is explained by the cross-linked structure of the polymer, providing a yield value and thus 'trapping' the oil droplets or solids (e.g. pigments) in the water/polymer matrix. 'Yield value' reflects the minimum force that must be applied to the liquid to start disrupting the structure imparted by Gemagique HP and Gemagique CP1, so flow can occur.

Aqueous Gels

Aqueous gels (e.g. hair gels) are prepared by adding the water phase to Gemagique HP, Gemagique HPS and Gemagique CP1. Special care should be taken for good agitation. The transparency of the resulting aqueous gels is dependent on the amount of Gemagique HP, Gemagique HPS and Gemagique CP1 used in the formulation. Concentrations of Gemagique HP, Gemagique HPS and Gemagique CP1 of 1% and higher provide transparent, clear gels. Slightly turbid gels can be transformed into clear formulations by addition of approximately 5% solvent, e.g. glycerin. The best gel clarity is obtained by using demineralized or deionized water.

Gemagique HP, Gemagique HPS and Gemagique CP1 both show good compatibility with other polar organic solvents. Hydro-alcoholic, transparent gels can be made comprising more than 50% ethanol. Typically, Gemagique HP, Gemagique HPS and Gemagique CP1 are added to the water/ethanol mixture. Ethanol can be used to dissolve active ingredients while avoiding the use of solubilizers such as PEG-40 hydrogenated castor oil, Polysorbate 20 or similar ingredients.

In this way it is easy to prepare hydro-alcoholic gels containing perfume oils, oil-soluble UV-filters, actives (e.g. bisabolol) and film formers, etc.

In case of high ethanol or isopropanol contents additional preservation is not required. To manufacture hydro-alcoholic gels using Gemagique

HP and Gemagique HPS the best option is to first prepare the aqueous gel and subsequently add active solution (or film former). This solution can be prepared for example by dissolving the Gemagique ethanol to form a gel. Preferably, a slow moving anchor stirrer is used to minimize the trapping of air bubbles.

Limitations

Like all other polyelectrolytes, e.g. carbomers, Gemagique HP, Gemagique HPS and Gemagique CP1 are sensitive to electrolytes. Therefore, Gemagique HP, Gemagique HPS and Gemagique CP1 are not suitable to thicken shampoos, shower gels and other systems containing salt.

Gemagique HP, Gemagique HPS and Gemagique CP1 can be used in a broad pH range of 4.0 - 9.0. Lower pH than pH 4.0 will lead to acidic cleavage of the polymer on prolonged storage and thus to a loss in viscosity. As Gemagique HP, Gemagique HPS and Gemagique CP1 are ammonium salts, higher pH values of more than 9.0 will release ammonia.

Hand Sanitizers

Gemagique HP, Gemagique HPS and Gemagique CP1 show high stability in alcohol concentrations >80% making them excellent thickening agents in hand sanitizer formulations. Additionally, both are compatible with a broad range of essential oils and most perfume oils.

METHOD: 10-LITRE PREPARATIONS

These can be prepared in 10-litre glass or plastic bottles with screw-threaded stoppers.

Recommended amounts of products:

FORMULATION 1	FORMULATION 2
<ul style="list-style-type: none">Ethanol 96%: 8333 mlHydrogen peroxide 3%: 417 mlGlycerol 98%: 145 ml	<ul style="list-style-type: none">Isopropyl alcohol 99.8%: 7515 mlHydrogen peroxide 3%: 417 mlGlycerol 98%: 145 ml



CONTACT US

www.curiaglobal.com

Storage Recommendations

The product is stable when stored in the original container protected from direct sunlight in a dry, cool and well-ventilated area. The product must be protected from humidity during storage. Further information on handling, storage and use is given in the EC safety data sheet. This information is based on our present state of knowledge and is intended to provide general notes on our products and their uses. It should not therefore be construed as guaranteeing specific properties of the products described on their suitability for a particular application.

Any existing industrial property rights must be observed. The quality of our products is guaranteed under our General Conditions of Sale.

Quality Management

Gemagique is produced under cosmetic GMP.

Availability

We have large capacity and small-scale facilities dedicated to the manufacture of Gemagique for our customers. A complementary technical package is available upon request at clientservicesapi@curiaglobal.com.

Curia, formerly AMRI, is a global contract research, development and manufacturing organization, offering products and services across the drug development spectrum to help our partners turn their ideas into real-world impact. We partner closely with pharmaceutical and biotechnology companies to boost business performance and improve patients' lives.

