

# Development and rheological evaluation of hydrophilic cosmetic gel

Poster  
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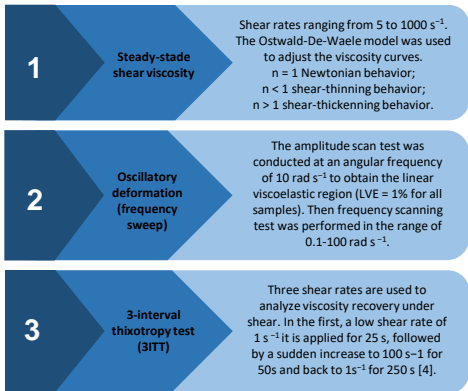
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## Introduction:

Hydrophilic thickeners are raw materials of natural or synthetic origin, capable of swelling in the presence of water, giving viscosity to the medium in such a way that the resulting product can take the appearance of gel. Hydrophilic thickeners can be of natural origin, of synthetic or semi-synthetic origin. They can be classified as gums, alginates, cellulose derivatives, clays, gelatin, synthetic resins, among many others that have been emerging in recent times [1]. Among synthetic resins, there are several types of carbomers (carboxyvinyl polymer), among which one can mention the carbomers 934, 940, 960, NF, among others [2]. These materials can be applied, for example, in drug and cosmetic delivery systems. Rheological analysis is one of the techniques used to study gels as to their mechanical and flow behavior. This technique allows analyzing the flow of a fluid and the deformations that are exerted in it, enabling the determination of system stability parameters [3]. The objective of this study was to develop and evaluate the Rheology of a hydrophilic gel.

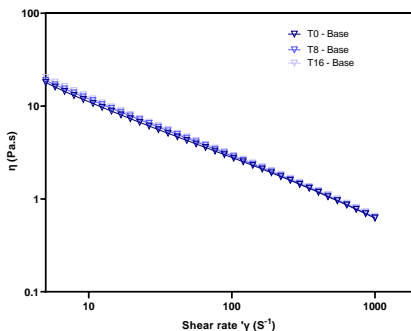
## Materials & Methods:

The flow properties, viscoelastic behavior and thixotropy of the formulations were evaluated as stability parameters of the formulation over 16 weeks at room temperature. Rheological measurements were carried out on the Anton Paar MCR-102 modular Compact rheometer with plate cone geometry (50 mm diameter, cone angle of 0.9815 and truncation of 0.97 RMB) at a temperature of 32.6 RMB C.



## Results & Discussion:

Figure 1. Steady state viscosity curves for base and formulation at times 0, 8 and 16 weeks.



## Results & Discussion:

Figure 2. Oscillatory deformation curves for the formulation at times 0, 8 and 16 weeks.

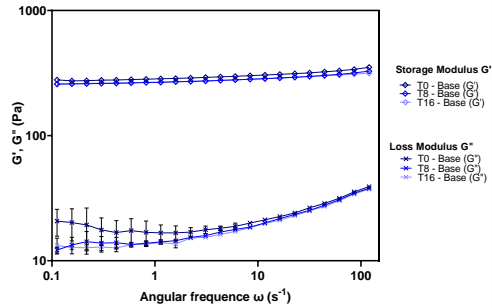
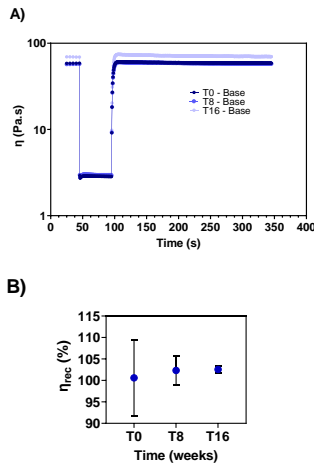


Figure 3. A) viscosity curves as a function of time for three interval thixotropy test (3itt) for formulation; B) percentage of viscosity recovery as a function of time, showing structural regeneration after 3ITT.



## Conclusions:

The vehicle used can impact the stability and effectiveness of cosmetic products. Rheological study can predict the physical stability of formulations and help formulators in the development of more stable formulas, therefore more effective and with better acceptance by consumers. Gel consisting of carbomer, glycerin, phenoxyethanol and Ethylhexyl glycerin, disodium EDTA, sodium hydroxide and water presented a stable rheological state over 16 weeks, in addition to showing "solid-like" behavior (gel). In addition, it was characterized as a strong gel and shear-thinning pseudoplastic non-Newtonian fluid, as well as absence of thixotropy. It is concluded that the gel developed is a promising formulation for future topical administration of cosmetic assets.

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