Polyquaternium-68: A Styling Polymer with an Unusual Character

Author: Vittoria Signori, Sr. Technical Service Specialist, BASF Corporation, Ledgewood, NJ, USA

Abstract

Luviquat Supreme (Polyquaternium-68) is a new cationic polymer for hair care applications. During the investigation of its styling properties, a rather unique film forming behaviour was encountered. This article describes the unusual character of the film formed when Luviquat Supreme is combined with Panthenol, the transformation from a very brittle and resistant film, to a very flexible one (Figure 1), yet capable of the same styling ability and curl retention.

Introduction

Styling formulations are typically formulated around the choice of either the styling agent or the thickening agent. Most styling mousses, spritzes and serums can be formulated having a cationic polymer to deliver most of the styling and conditioning attributes.

Luviquat Supreme (INCI: Polyquaternium-68) is a new cationic styling polymer which has been shown to have, in addition to the conventional setting and holding properties, surprising film flexibility. This article will briefly outline our findings.

Luviquat Supreme (Figure 2) is a very good film former, its molecular weight, of about 300,000 and its ability to resist water absorption during exposure to high humidity climates, make this polymer a top choice for volumizing and long lasting styling lotions, mousses and in general hair preparations.

The film properties reported below are somewhat predictable, the scale of magnitude, however, is not. All film formers commonly used in cosmetics can be plasticized, this makes their films more flexible, less flaky and more pleasing to the touch. In our study we found that by adding panthenol to Luviquat Supreme we do not just see an increase in the flexibility of the polymer films, but we also see that the stiffness of the films is maintained.

The experiment

The determination of the elongation at break and other mechanical properties of polymer films were performed with a Stable Micro System apparatus. Polymer films, of the shape and size shown below, were placed into the clamps of the device at 20°C and 55% relative humidity and stretched.

The data reported below (Figure 3 and 4) is for polymer films prepared from a water solution containing 10% solids of Luviquat Supreme and 5% solids of panthenol. The polymer films are first stretched up to 480% of their original length. After reaching their full elongation the films were removed from the device and observed to retract over time in an elastic fashion. Most of the film retraction occurs during the first few seconds. This property makes Luviquat Supreme both a strong and flexible polymer.

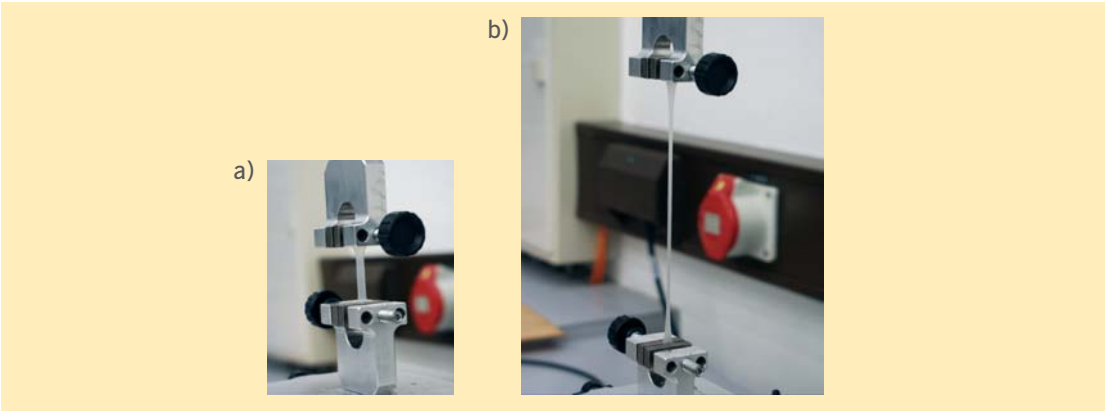

Figure 1: Pictures taken during the measurements (a) initial length and b) maximum elongation)