

The Effects of Humidity on Hairstyles: Analysis of the mechanical properties of styling polymers

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Abstract

The aim of this study is to extend the knowledge gained through the dynamic humidity curl retention (DHCR) to determine the influence of the polymers in the composite (polymer/hair) in order to differentiate the polymers and characterise their properties. The DHCR, as a further development of the High Humidity Curl Retention, is a method to determine the time-dependent ability of treated hair strands to retain a certain hairstyle under rapid humidity change [1]. The performance of the polymers in the DHCR indicated a drastic change of the mechanical properties of the polymer through the humidity variation. Therefore, the softening behaviour by moisture is investigated with regard to its effects on the mechanical properties using the torsion-pendulum method where the storage and loss moduli are determined [2]. For a more profound understanding of the pure polymer characteristics the interaction with an inert carrier is investigated. Based on the determined moduli, it is possible to define the humidity-dependent glass transition [3]. By considering both methods, we want to generate new insights into the moisture-dependent properties of the polymers in order to achieve a better explanation of their behaviour.

Keywords: curl retention, glass transition, humidity dependence, mechanical properties

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