New Hairstyling Polymer gives Natural Hold

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Abstract

For a hairspray to produce the desired effect, it must satisfy a number of technical requirements. The polymer used plays a key role in this regard. A novel vinyl acetate/silicone copolymer has proved superior to conventional hairstyling polymers in all application phases – from spraying to hairstyle retention. Hairsprays with high water content can be formulated. They dry fast and stop feeling sticky very quickly. The new polymer imparts good hold and at the same time gives hair a soft, natural feel.

Introduction

Hairstyles are a means of expressing personality and individuality. Thus, most people like to keep their hairstyle in shape as long as possible. For over 50 years, consumers have used hairsprays for this purpose. Today, hairsprays still comprise the largest market segment for hairstyling products. The product range has become very broad and diverse. All these products target a range of different hair types and clearly differ in their effects.

A hairspray is a low-viscosity solution of polymer in an alcohol or water/alcohol solvent and contains a propellant. The polymer content of the solution ranges from 2 to 10 weight percent. The propellant is usually dimethyl ether or a propane/butane mixture. The polymer solution is turned into an aerosol at the press of a button. In the process, the propellant vaporises immediately. The aerosol particles are between 30 and 90 μm in size. In colloquial usage, no real differentiation is made between the hairspray product and the scientific spray, the aerosol. Below, the term "hairspray" refers to the aerosol, i.e. the atomised formulation.

Hairspray Effects

The entire hairspray application consists of three key phases: (1) the spraying process, (2) spreading of applied polymer solution over the hair and crosslinking of hair fibres, (3) wearing of the treated hairstyle.

The aerosol is generated by the spraying process. When sprayed the aerosol droplets land on the hair (Figure 1) and spread along the hair fibres to form a liquid film.

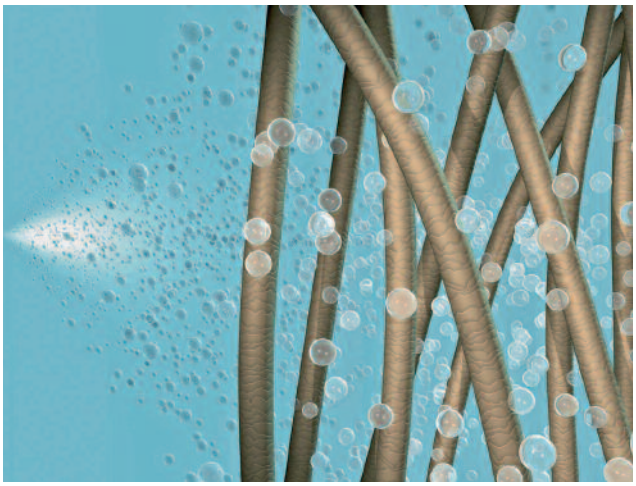

Figure 1 Developing a fine spray which reaches the hair

The film moves along the individual hair fibres and spontaneously breaks up into separate liquid parcels (Figure 2).

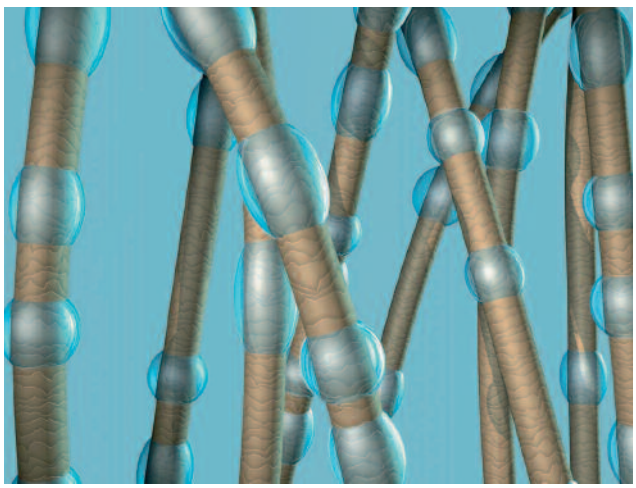

Figure 2 The polymer solution moistens the hair fibres; the running film arranges itself in a pearl-like fashion (Rayleigh instability)

Surface tension causes this polymer solution to collect between the fibres, especially where they intersect (Figure 3).