

Protection of Oxidative Hair Colour Fading from Shampoo Stripping by Styleze® W-20

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Abstract

The technology associated with hair colour has resulted in greatly advanced formulas where consumers can achieve vibrant, multi-dimensional colour. Unfortunately, after some time hair colour begins to lose its vibrancy and original hue; in some cases, consumers may find that the colour shifts to one that does not express their original image. The loss of colour can be due to colour wash-out which is experienced from shampooing or by environmental impact (e.g., UV radiation). Since the majority of hair colour used today is permanent colour, we decided to focus on the prevention of colour stripping from shampoo washing of level 3, oxidative dye treated hair. We have found a system based on Polyquaternium-55 that offers a protective effect on hair to prevent colour loss from shampoo washes.

Introduction

Fading of oxidative hair colour has become a common problem and a source of frequent complaints by consumers. With advances in hair colour technology resulting in more vibrant, multi-tone dye formulations and consumer friendly hair dye applicators, hair colour is no longer used just to cover the grey but to enhance our most prized accessory, our hair. Today consumers are willing to experiment with a palette of shades and highlights, depositing and removing colour, to define one's self-image. The most common complaint is that after a couple of weeks the colour-treated hair begins to look dull, loss of vibrancy and intensity, yielding a shade shift deemed non-desirable. It is known and documented that the fading of dyed hair occurs as colour wash-out during the shampooing process through diffusion, or can be initiated by environmental circumstances such as exposure to UV radiation which can break down the colour molecule. In particular this is observed with red shades, as they are of relatively small molecular size.

Consumers want to maintain the vibrancy of the colour until the next oxidative process. This translates to protecting hair colour from fading for up to six weeks when colour will need to be refreshed as noticeable re-growth will need to be coloured. Meeting this consumer need continues to be a significant challenge to the cosmetic industry. The primary objective of our research was to develop a technology that provides measurable and consumer perceivable protection against colour loss during the shampoo washing of dyed hair. Our focus was to prevent colour stripping of permanent, level 3, oxidative dye treated hair, as this comprises the majority of the professional and mass market formulations. To accomplish this objective, we have developed methodologies for evaluating hair colour change and have linked these methods and measurements to consumer perceivable changes in hair colour.

We have developed a hair colour protection technology based upon the application of hydrophobically modified cationic polymers (patent pending). These polymers have both hydrophobic moieties and cationic charges to maintain substantivity to hair during washing, while providing a hydrophobic barrier to "lock-in" hair dye and thereby prevent it from washing out during shampooing process. Among these polymers, Styleze W-20 has proven to be most effective when formulated in a 3 step anti-fading system, comprising a shampoo, conditioner, and leave-in treatment or styler. We have identified Styleze W-20 anti-fading formulations which when combined as a regimen provide up to 50% colour protection. This regimen significantly outperforms the current commercial benchmarks tested. The colour protection benefit of Styleze W-20 anti-fading system is consumer perceivable and was confirmed by mannequin heads with human hair.

Chemistry

Styleze W-20 is the terpolymer of vinylpyrrolidone (VP), dimethylaminopropyl methacrylamide (DMAPMA), and methacryloylaminopropyl lauryldimonium chloride (MAPLDAC) (INCI name: Polyquaternium 55). The polymer provides high