

## Correcting Hair Cuticle Damage with the Bonding Action of Crodabond CSA

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### Abstract

Hair that is damaged through colouring, bleaching, perming or thermal straightening, usually can be seen through SEMs as having lifted, broken and uneven cuticle layers. Once the cuticles are damaged, they cannot regenerate to restore a smooth, healthy look. Crodabond CSA was specifically engineered to seal down hair cuticles that have been damaged. As an oligo ester derived from sebacic acid and hydrogenated castor oil, Crodabond CSA adheres to the lifted cuticles, cementing them together and smoothing out the hair fibre. This article describes how hair fibre cuticles are damaged with an hydrogen peroxide and ammonium mixture that cause visible damage via SEM photos, feel characteristics through a friction test and consumer perception through panel evaluations. Then how by mechanical interactions one can achieve hair fibres with smooth cuticles that are durable through multiple washes.

### Introduction

Consumers visit salons for a wide variety of hairstyling services ranging from a simple cut to more complex processes such as colouring, relaxing, or perming. To perform these types of chemical treatments, a process is used to allow the 'active' to

penetrate the cortex and change the hair's structure. Because of the chemicals used, cuticles are lifted and can be permanently damaged and easily abraded. Over time, these raised cuticles become worn away, resulting in damaged, weak hair with split ends and breakage.

To try and 'repair' this damage, an intensive conditioning treatment is normally used to condition and try to restore the pre-treatment lustre of hair. Crodabond CSA (INCI Name: Hydrogenated Castor Oil/Sebacic Acid Copolymer) is a superior ingredient for these restorative conditioning products, as it was specifically engineered to seal down hair cuticles and keep them bonded together through normal daily cleansing and conditioning. As an oligo ester derived from sebacic acid and hydrogenated castor oil, Crodabond CSA adheres to the lifted cuticles, cementing them together and smoothing out the hair fibre. It coats the hair fibre and works its way in between the lifted cuticles, perhaps getting in the  $\delta$ -layer of the cell membrane complex (CMC), and acts as a cement to reseal the hair fibre cuticles. After shampooing, residual surface Crodabond CSA is rinsed away, leaving only the binding material in the CMC as a cuticle sealant (Figure 1).

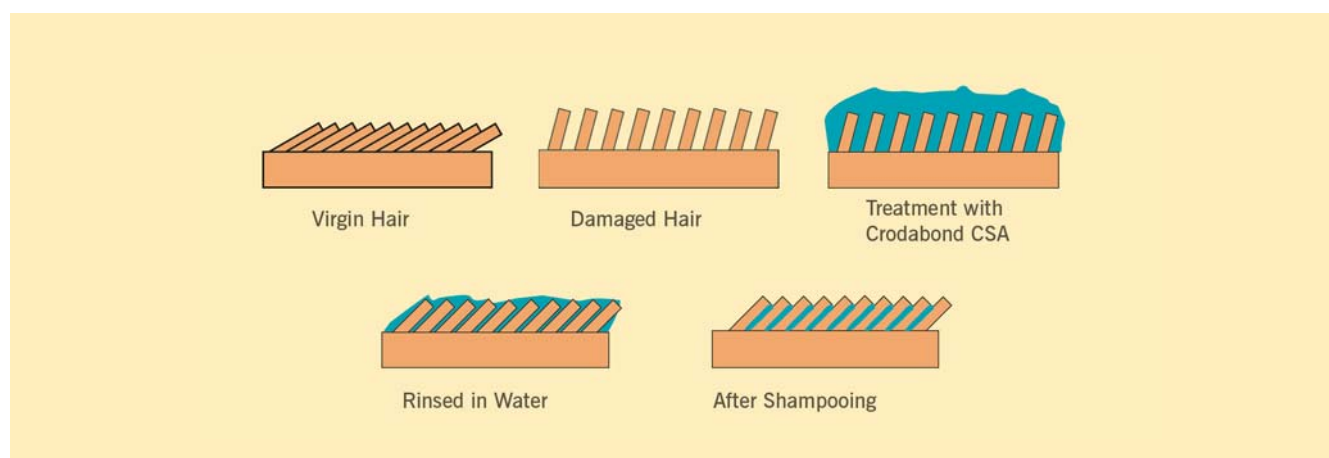


Figure 1: Schematic of Crodabond CSA cuticle binding mechanism on the hair fibre