
Certified Specialist Programme in Afro Hair Care

Chemistry of Hair

Chemistry of Hair in Afro Hair Care Certified Specialist Programme

Chemistry of Hair:

The study of the chemical composition and structure of hair is essential for understanding how to properly care for and style it. Hair is primarily composed of a protein called keratin, which is made up of amino acids. The arrangement of these amino acids gives hair its unique properties such as strength, elasticity, and texture.

Keratin:

Keratin is a fibrous structural protein that makes up the outer layer of human skin, hair, and nails. It is a tough and insoluble protein that provides strength and resilience to hair. The amino acids that make up keratin include cysteine, which forms disulfide bonds with other cysteine molecules, contributing to the strength and structure of hair.

Amino Acids:

Amino acids are the building blocks of proteins, including keratin. There are 20 different amino acids that can combine in various sequences to form different proteins. Some of the key amino acids found in hair include cysteine, methionine, and tyrosine. Cysteine is particularly important for hair strength as it forms disulfide bonds that give hair its structure.

Disulfide Bonds:

Disulfide bonds are covalent bonds formed between two sulfur atoms in cysteine amino acids. These bonds are responsible for the strength and elasticity of hair. Chemical treatments such as perms and relaxers work by breaking and reforming disulfide bonds to change the shape of the hair. Over-processing can lead to damage and breakage due to an excessive breakage of these bonds.

Hydrogen Bonds:

Hydrogen bonds are weaker bonds formed between the hydrogen atoms of one molecule and the oxygen or nitrogen atoms of another molecule. These bonds are responsible for the temporary shaping of hair, such as when hair is curled with a hot styling tool. Heat can break these bonds, allowing the hair to be reshaped, but the bonds reform as the hair cools, maintaining the new shape.

Van der Waals Forces:

Van der Waals forces are weak intermolecular forces that occur between molecules due to temporary fluctuations in electron distribution. These forces play a role in maintaining the structure of the hair shaft and keeping the cuticle layer closed. Proper conditioning can help minimize damage to the cuticle layer and

reduce the impact of these forces.

pH Balance:

The pH balance of hair refers to its level of acidity or alkalinity. The ideal pH for hair is around 4.5 to 5.5, which is slightly acidic. Maintaining the proper pH balance is crucial for the health of hair as it affects the cuticle layer and overall condition. Alkaline products can raise the pH of hair, causing the cuticle to swell and become more susceptible to damage.

Acidic:

Acidic substances have a pH below 7 and can help to seal the cuticle layer of the hair, making it smoother and shinier. Acidic products, such as apple cider vinegar rinses, can help restore the pH balance of hair and reduce frizz.

Alkaline:

Alkaline substances have a pH above 7 and can cause the hair cuticle to swell and become more porous. Alkaline products, like relaxers and some shampoos, can disrupt the natural pH balance of hair, leading to dryness and breakage if not used properly.

Emollients:

Emollients are substances that help to soften and smooth the hair by filling in gaps in the cuticle layer. They can include ingredients like oils and silicones that provide a protective coating to the hair shaft, improving its texture and appearance.

Humectants:

Humectants are substances that attract moisture from the air and help to retain it in the hair. Common humectants include glycerin and hyaluronic acid, which can help to hydrate dry hair and prevent frizz. However, in very dry conditions, humectants may draw moisture out of the hair, leading to dryness.

Proteins:

Proteins are essential for maintaining the strength and structure of hair. They can help repair damage to the hair shaft and improve its elasticity. Protein treatments can be beneficial for damaged or weakened hair, but too much protein can make the hair brittle and prone to breakage.

Moisturizers:

Moisturizers are products that help to hydrate and nourish the hair, improving its overall health and appearance. They can include ingredients like water, glycerin, and plant oils that help to restore moisture to dry hair and prevent brittleness.

Cleansing Agents:

Cleansing agents are ingredients in shampoos and cleansers that help to remove dirt, oil, and product buildup from the hair and scalp. Common cleansing agents include surfactants like sulfates and sulfonates that create lather and help to lift away impurities.

Conditioners:

Conditioners are products that help to improve the texture and manageability of hair by smoothing the cuticle layer and reducing frizz. They can contain ingredients like silicones, fatty alcohols, and plant oils that provide moisture and protection to the hair shaft.

Sealers:

Sealers are products that help to lock in moisture and protect the hair from environmental damage. They can include ingredients like oils, butters, and waxes that create a barrier on the hair shaft, preventing moisture loss and reducing frizz.

Styling Products:

Styling products are used to create specific looks and hold hairstyles in place. They can include gels, mousses, pomades, and hairsprays that provide texture, volume, and hold to the hair. Styling products should be chosen based on the desired style and hair type.

Heat Protectants:

Heat protectants are products that help to shield the hair from damage caused by heat styling tools like flat irons and curling irons. They can contain ingredients like silicones and polymers that create a protective barrier on the hair shaft, reducing the impact of heat.

UV Protectors:

UV protectors are products that help to shield the hair from the damaging effects of the sun's ultraviolet rays. They can include ingredients like UV filters and antioxidants that protect the hair from UV-induced dryness, frizz, and color fading.

Anti-Breakage Treatments:

Anti-breakage treatments are products that help to strengthen and fortify the hair, reducing breakage and split ends. They can contain ingredients like proteins, vitamins, and amino acids that improve the resilience and elasticity of the hair shaft.

Color Treatments:

Color treatments are products that are used to change the color of the hair, either permanently or temporarily. They can include hair dyes, bleaches, and toners that alter the natural pigmentation of the hair. Color treatments should be done carefully to minimize damage and maintain the health of the hair.

Chemical Treatments:

Chemical treatments are processes that alter the structure of the hair, such as perms, relaxers, and keratin treatments. These treatments work by breaking and reforming the bonds in the hair shaft to change its shape or texture. Chemical treatments should be done by trained professionals to avoid damage to the hair.

Proper Care and Maintenance:

Proper care and maintenance of the hair are crucial for keeping it healthy and looking its best. This includes

regular washing, conditioning, and styling with appropriate products for your hair type and concerns. Avoiding excessive heat styling, chemical treatments, and over-manipulation can help prevent damage and breakage.

Challenges in Afro Hair Care:

Afro-textured hair has unique characteristics that require specific care and attention. Challenges in Afro hair care can include dryness, breakage, shrinkage, and difficulty in retaining length. Understanding the chemistry of Afro hair and using products tailored to its needs can help address these challenges and maintain healthy, beautiful hair.

Conclusion:

Understanding the chemistry of hair is essential for providing proper care and maintenance to keep it healthy and looking its best. By knowing the key terms and vocabulary related to hair chemistry, you can make informed decisions about the products and treatments that will benefit your hair type and concerns. With the right knowledge and approach, you can achieve beautiful, strong, and vibrant hair that reflects your unique style and personality.