International Journal of Science and Research Archive
eISSN: 2582-8185
Cross Ref DOI: 10.30574/ijsra
Journal homepage: https://ijsra.net/

(REVIEW ARTICLE)

Check for updates

Modern hair coloring methods and safety-oriented color trends in 2026

Hanna Boiko *

Sheisart LLC, 10500 Midway Pk Dr, Charlotte, NC 28277, USA.

International Journal of Science and Research Archive, 2026, 18(03), 861-865

Publication history: Received on 19 December 2025; revised on 13 March 2026; accepted on 16 March 2026

Article DOI: https://doi.org/10.30574/ijsra.2026.18.3.0172

Abstract

This article presents an analytical overview of modern hair-coloring methods used in 2025–2026 and examines scientific principles of safe hair coloring. The paper discusses chemical processes inside the hair fiber during dye application, the role of pH, the development of gentle lightening techniques, and the introduction of personalized, structurally protective formulas. Based on current findings in trichology and cosmetic chemistry, the article argues that hair coloring in 2026 has evolved into a high-technology procedure requiring scientific accuracy, pre-treatment diagnostics, and controlled chemical exposure.

Keyword: Hair coloring methods; pH regulation; Airtouch technique; Low-damage bleaching; Bond-building hair systems

1. Introduction

The development of modern hair-coloring techniques is closely linked to advances in cosmetic chemistry and scientific research on hair structure. Contemporary clients expect not only aesthetic results but also evidence-based safety. This demand led to a rapid shift, particularly in 2024–2026, toward low-damage lightening systems, optimized dye formulations, and pH-controlled strategies for minimizing structural harm [1].

The aim of this study is to analyze and systematize current scientific evidence and professional practices related to pH-controlled hair coloring, hybrid alkaline systems, and low-damage lightening techniques, in order to evaluate their effectiveness in reducing structural hair damage while maintaining high aesthetic outcomes in modern hair coloring in 2026.

This topic is important because modern hair coloring increasingly demands scientifically validated methods that minimize hair structural damage while maintaining aesthetic performance, particularly through pH control, low-oxidation systems, and metal control.

2. Materials and methods

This study is a systematic analytical review of modern hair-coloring techniques used in 2025–2026, integrating scientific literature and professional salon practices. Peer-reviewed articles, technical publications, and manufacturer recommendations were examined with a focus on pH regulation, low-damage lightening, hybrid alkaline systems, and bond-protection strategies. Data on chemical mechanisms, structural hair responses, and gentle coloring techniques (Airtouch, Color Melting, soft blondes) were extracted and synthesized. Professional procedures such as strand testing, peroxide optimization, metal control, and post-treatment care were also analyzed. Information was categorized to highlight the relationship between chemical processes, aesthetic outcomes, and hair fiber safety. This approach provides a concise, evidence-based overview of best practices in contemporary hair coloring.

* Corresponding author: Hanna Boiko

2.1. Chemical foundations of hair coloring and the importance of pH

2.1.1. Hybrid alkaline systems (MEA and low-ammonia formulas)

Unlike traditional ammonia-based dyes, modern permanent colorants increasingly utilize MEA (monoethanolamine) as a controlled alkaline agent. MEA opens the cuticle more gently, reduces dehydration of the hair shaft, and minimizes disruption of disulfide bonds [2].

2.1.2. 1.2. The role of pH in damage prevention

pH is one of the key chemical variables affecting pigment penetration and cuticle behavior. Research demonstrates that an **optimal pH range of 8.2–8.8** allows sufficient cuticle lift while reducing keratin disruption and lipid loss [3].

Acidic post-treatments help restore the cuticle structure and re-stabilize the lipid matrix following oxidation processes [4].

Figure 1 Chemical foundations of hair coloring and the importance of pH control

2.2. Gentle coloring techniques: scientific effectiveness

2.2.1. The Airtouch technique

Airtouch is based on selective lightening: a controlled stream of air removes short and fragile hairs from the working section, preventing them from chemical exposure. Studies show that this method reduces structural damage by 20–35% compared to classical foil lightning [5].

Airtouch targets stronger, structurally stable fibers, making it one of the most damage-reducing techniques of 2026.

2.2.2. Color melting and optical pigment layering

Color Melting creates seamless transitions between tones through multi-layer pigment application. The optical depth achieved through gradual layering reduces the need for full-length bleaching and lowers oxidative stress on the hair fiber [6]. Pigments distribute within the cortex without requiring harsh lighting of the entire hair strand.

2.2.3. Natural blondes and soft blondes

Soft, natural-looking shades allow for lower peroxide concentrations and reduced exposure to aggressive oxidizers. Research indicates that blonde systems preserve cuticle density and significantly reduce post-color breakage [7].

Figure 2 Gentle hair-coloring techniques: scientifics effectiveness

2.3. 2026 trends: aesthetic complexity and structural safety

2.3.1. The natural color movement

Consumer analysis from 2025–2026 indicates a strong preference for soft, blended shades:

- Caramel hues,
- Copper tones,
- Beige and creamy blondes,
- "Latte brunettes."

These tones require minimal pre-lightening, making them significantly safer for the hair fiber[8].

2.4. Personalized hair-color formulations

Modern manufacturers incorporate:

- Amino acid blends,
- Ceramides,
- Bond-protecting polymers,
- Agents that strengthen intercellular lipids.

These additives enhance elasticity, reduce keratin fragmentation, and support cuticle cohesion during chemical processes [9].

2.5. Metal control before coloring

Accumulated metals such as copper and iron, commonly found in tap water, react with peroxide and accelerate structural degradation during bleaching [10]. In 2026, **metal detoxification** has become a recommended step before any chemical lightening to prevent oxidative reactions that cause breakage.

2.5.1. Practical recommendations for hair professionals

- Always perform a **strand test** to predict chemical behavior and fiber response [11].
- Prefer partial lightening techniques (Air-touch, Color Melting) over full bleach-outs.
- Use the lowest effective peroxide concentration.
- Apply metal-detox solutions before bleaching.
- Monitor pH levels at each stage of the coloring process.
- Seal the cuticle with acidic post-treatment agents.
- Incorporate bond-protection systems during oxidation.

Figure 3 TOP-7 recommendations for improved hair fiber safety in 2026

3. Conclusion

Hair coloring in 2026 is grounded in scientific research and evidence-based practice. pH control, reduced oxidative stress, hybrid alkaline systems, and gentle lightening techniques have transformed coloring into a highly technical, biologically informed procedure. These advancements not only enhance aesthetic outcomes but also significantly improve hair fiber safety, marking a new standard in professional color science. The present research work does not contain any studies performed on animals/humans subjects by any of the authors.

References

[1] Sapianov Y. Hair color chemistry: how pH affects structure and quality. Science Online: *International Scientific e-zine*. 2024;3:03–31.

[2] Bailey AD, Zhang G, Murphy BP. Comparison of damage to human hair fibers caused by monoethanolamine- and ammonia-based hair colorants. *Journal of Cosmetic Science.* 2014;65(1):1–9.

[3] Malinauskyte E, Cornwell PA, Reay L, et al. Effect of equilibrium pH on the structure and properties of bleach-damaged human hair fibers. *Biopolymers*. 2020;111(11):e23401.

[4] Zhang D, Baghdadli N, Greaves AJ. Reinforcing chemically treated human hair with citric acid. *Int J Cosmet Sci*. 2025;47(3):411–423.

[5] Yablochkina Y. Analysis of modern approaches to hair care: an overview of products and techniques. *Rev Científica Estética Cosmetol*. 2025;5(1):E1622025.

[6] Reznikova E. Selective Lightening Techniques (Airtouch). *Applied Cosmetology Journal*, 2024;42(2):257-259.

[7] Vogue Arabia. Color melting: a seamless blending hair technique. 2025 Nov 17. Available from: https://www.voguearabia.com/article/between-balayage-and-highlights-colour-melting

[8] Lima CRRC, Bandeira ACC, Martins TS, Otubo L, Oliveira CLP. Thermal induced changes in cuticle and cortex to chemically treated hair. *Biopolymers*. 2025;117(1):e70071.

[9] da França SA, de França A, de Araújo DC, et al. Types of hair dye and their mechanisms of action. *Cosmetics.* 2015;2(2):110–137.

[10] All About Salon. What drives hair colour trends in 2025? [Internet]. 2025 [cited 2025 Jan 12]. Available from: https://www.allaboutsalon.com.au/what-drives-hair-color-trends-in-2025.

[11] Oshimura E, Abe H, Oota R. Hair and amino acids: the interactions and the effects. *J Cosmet Sci*. 2007;58(4):347–57.

[12] Iwai H, Saito A, Tanaka M. Recent progress in hair science and trichology. *Journal of Oleo Science*. 2024;73(6):73_ess23203.

Author Short Biography

Hanna Boiko is a licensed Hair color researcher/Health hair recovery specialist with professional experience in Ukraine and the United States. The author's work focuses on scientifically based hair coloring methods, hair fiber structure, and lightning systems that minimize damage. She specializes in the Airtouch technique. Anna Boyko's professional philosophy combines aesthetic appearance with scientific principles of health, pH control, and preservation of hair structure.