

# Hair Damage: It's Not Your Fault

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A dark blue diagonal graphic that starts from the bottom left corner and extends towards the top right corner, creating a triangular shape in the bottom right of the page.

# Question

- How does the pH level within hair products contribute to hair damage? Why? What type of hair product is the best to use?

# Hypothesis

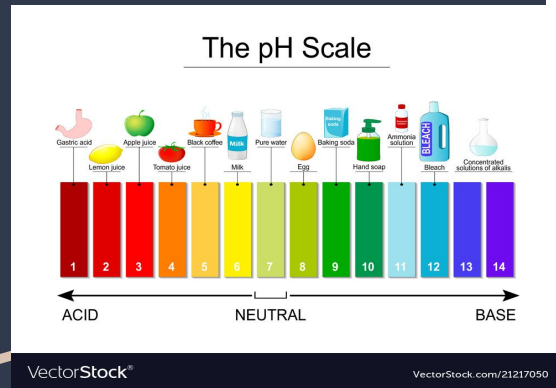
- I hypothesize that the lower the pH levels within the hair product, the more hair damage it can cause. The acid levels within the hair product can cause the cuticles within the hair surrounding the scalp to slowly start to peel, eventually causing the strength of the hair to get damaged.

# Method

- First, research what pH levels correspond with
- Next, research about why hair product brands may benefit from using acids within their products
- Later, research how acids/bases co-relate with hair damage
- Next, see how acids/base levels within hair products cause the hair, scalp and roots to get damaged
- After researching how the amount of acidity can cause more or less damage
- Test different hair products to see their pH levels and test them out on hair samples
- Create a table to compare the results

# What is pH levels?

- Complete form: the potential of Hydrogen
- pH levels or scales are used to see how acidic or basic a substance is
- Is a logarithmic scale
- The scale is from 0 (very acidic) to 14 (basic/alkaline),
  - ◆ is water is neutral 7



# How is pH measured



- An easy way to measure pH levels is with pH strips.
  - ◆ Made with litmus paper
- When the pH strip is touched to a particular substance, the colour will change to show how strong of an acid or basic it may be
  - ◆ Red means acidic
  - ◆ Blue means alkali

# How does a pH scale work?

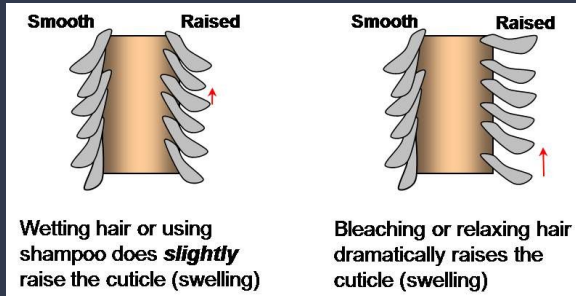
- 0-6: More Hydrogen particles within the substance
- 8-14: More hydroxide particles within the substance

# Why would hair brands use alkalis within their products?

- Hair brands usually use alkalines within their products so that the hair cuticles rise to absorb the product going within



# How does alkali within your hair cause hair damage



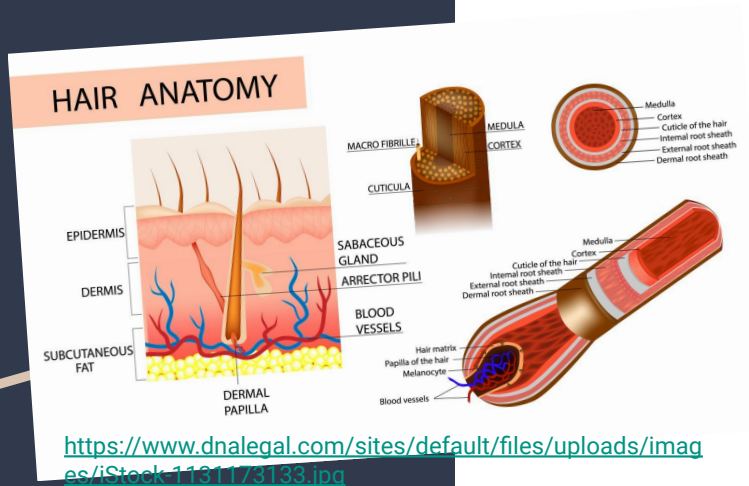
- Extreme alkalinity can eat away skin and hair
- Cause your hair's natural pH level to shift, causing dry hair

# Why would hair brands use acids within their products?

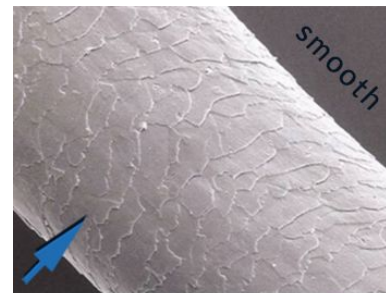
- Help to restore the hair's natural acidity, which allows it to hold hair dye more efficiently
- Citric acid is most commonly used to bring pH levels down
  - ◆ Usually also reduces frizz

# How does acids within your hair cause hair damage

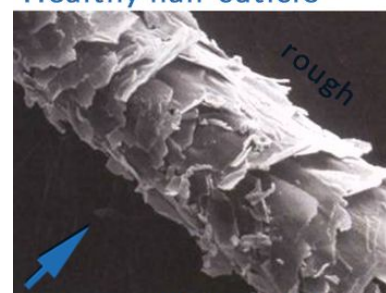
→ This causes the cuticle to stay open and become more receptive to damage



Maybe remove



Healthy hair cuticle



Damaged hair cuticle

[https://www.beiglaviacentre.com/download\\_file/view\\_inline/26882](https://www.beiglaviacentre.com/download_file/view_inline/26882)

# Is it better to use an acidic or alkali hair product?

- The use of more alkali hair products can cause the hair to seem rougher and dry (sublime life)
- A more acidic approach can cause more hair loss due to the cuticle hairs not being able to latch onto anything
- A balance can benefit the hair to a better and healthier hair
- To maintain a good pH balance, it should vary from 3.5 to 4.5

# Variables

- Independent Variable:
  - ◆ The Brand of Shampoos and Conditioner
- Dependent Variable:
  - ◆ The pH levels that are measured
- Controlled Variable:
  - ◆ Amount of product
  - ◆ Brand of pH strip
  - ◆ Water temperature
  - ◆ Amount of water
  - ◆ Time left out to dry
  - ◆ Same wig hair

# Material

- pH strips
- Different types and brands of shampoo and conditioners
- Wig (natural hair)
- Measuring spoons and cups
- Water at 38°C

<u>pH level</u>	<u>Hair Frizz</u>	<u>Cuticles weaken</u>	<u>Split ends</u>	<u>Dull Hair</u>	<u>Hair loss</u>
4	✓	✓	✓	✓	✓
5	✓	✓	X	X	✓
6	✓	✓	X	X	✓
7	X	X	✓	✓	X
8	✓	X	✓	✓	X
9	✓	✓	✓	✓	X

x= doesn't happen ✓ = does happen Research

Based

Comparing the different pH and their effect on the hair

Brand of Hair Product	Type	pH level
Argan Oil Hydrating Shampoo by Marc Antony	Oil	pH of 5
Dove: Anti-Dandruff Shampoo + Conditioner	2 in 1	pH of 6
Biotique : Bio Soya Protein Shampoo	Regular	pH of 6
Patanjali: Hair Cleanser Shampoo	Regular	pH of 8
Slikk: Shampoo, Conditioner & Body Wash	3 in 1	pH of 8
Native: Almond and Shea Butter	Regular	pH of 7

# Shampoos



Brand of Hair Product	Type	pH level
Live Clean Fresh Water hydrating Conditioner	Water	pH of 8
Clairol: Natural Instincts Brilliant Shine Conditioner	Regular	pH of 7
L'oréal Paris: Casting Crème Gloss	Regular	pH of 6.5
Argan Oil Hydrating Conditioner by Marc Antony	Oil	pH of 6
Biotique : Bio Soya Protein Conditioner	Regular	pH of 6

# Conditioners

# Conclusion from table

- The use of oil-based shampoos and conditioners is the better option
- The worst regarding the 3 in 1 and some regular shampoos and conditioners

# Conclusion

- The best form of shampoo and conditioner for most hair types is oil-based or water-based.
- Although acknowledging that using an acid and an alkali-based hair product can balance out the damage that may form within the hair, I understand that my hypothesis was wrong and that using a more acidic hair product will not cause as much damage as a more alkaline product.

# Next Steps

- My next step is to consider the time frame and repeated use of the shampoos and conditioners. I also want to evaluate the different hair types, whether they are dyed and if the hair has been affected by any diseases. Along with adding more variety and understanding how to balance the pH to have a positive reaction from the mixture.

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