

Hair Bleaching –Group 3

History

- Sodium perborate used in Far East
- Hydrogen Peroxide since 19th Century
 - Mostly widely used in modern products

Colour of Hair & Level System of Hair

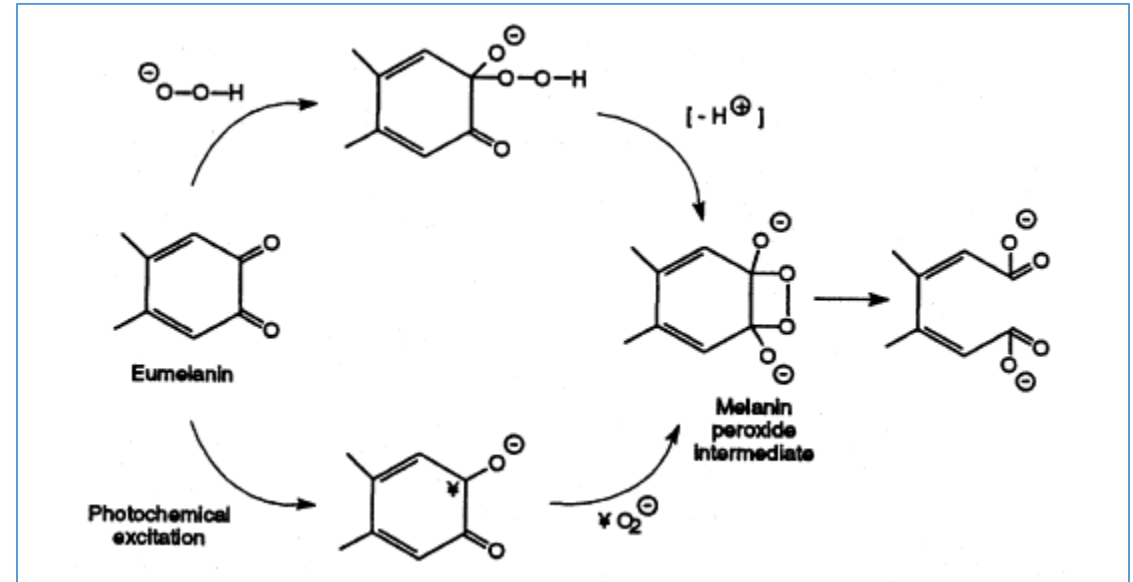
- 2 types of melanin
- Eumelanin (black to brown Insoluble)
- Pheomelanin (yellow to reddish brown, soluble in alkaline)
 - Typical found in N. Europe and Celtic races
- Standard system that most companies use
- Some companies have added further steps of 11 & 12 taking the colour to nearly white



Level	Colour
1	Black
2	Brown
3	Dark Chestnut
4	Chestnut
5	Light Chestnut
6	Dark Blonde
7	Blonde
8	Light Blonde
9	Very Light Blonde
10	Lightest Blonde

Mechanism of Hair Bleaching

- Active must penetrate the cuticle to reach the melanin on the cortex
- By oxidation to depolymerise the pigments with the formation of soluble carboxylate derivatives
- Light will also lighten the hair and this effect can be enhanced by the presence of hydrogen peroxide or an alkali medium such as soap
- Hydrogen peroxide alone only gives a reduction of 2 levels in 12 hours
- Hydrogen peroxide combined with solution of alkali (e.g. ammonia) reduces 2 levels in 30-40 minutes
- Hydrogen peroxide combined with solution of alkali (e.g. ammonia) and powder containing per-sulphates (oxidising agent) reduces hair colour level by 4



- Going from black hair to white is not recommended as damage will be caused and become straw like due to cysteine being converted to cysteic acid and the disulphide linkage is broken
- Some keratin converted soluble proteins can be lost leaving hair porous

Types of hair bleaching

- 4 types of concentration of hydrogen peroxide solution available
 - Higher concentrations available to hairdressers
- Number of different formulations mixed together just before use

Hydrogen Peroxide Solution/Emulsion/Cream

- (3% 6% 9% & 12%) household use (usually between 6% and 9%)
- Professional or salon trade 3%, 6%, 9% and 12% (also known as 10, 20, 30 and 40 volume)
- Higher concentrations are labelled “chemical”
- Stabilisers added to prevent decomposition of the hydrogen peroxide, common stabilisers, EDTA and sodium stannate.
- Phenacetin is avoided in modern products due to its toxicology
- Stability tests should be carried out after production
- The final product should be ideally be at a pH of less than 3.5, usually achieved with phosphoric or etidronic acid.

Types of hair bleaching

Liquid Products containing alkali

- Alkali accelerates decomposition of hydrogen peroxide and the bleaching of hair. Ammonia is most effective. pH around 10.
- Regarded as oxidative hair dye but without containing hair dye.
- Hair bleaching damages hair so include conditioning materials to reduce future physical damage.

Bleaching powders

- Essential for lift or lightening and used with peroxide and ammonia containing products as above
- Often contains ammonium and sodium persulphate with fillers eg silica and non-ionic cellulose and sodium metasilicate as alkali source
- Smooth paste to spread through hair but doesn't run down into eyes
- Consider toxicological properties of persulphates as they are respiratory sensitizers. Do not breathe in or use dedusted/granular product types.

Methods of Manufacturing hair bleaching products

- Use specialists in hair bleaching products due to safety reasons.
- Handle hydrogen peroxide carefully and consult MSDS
- Ammonia is also dangerous and avoid creation of ammonia gas
- These product types can be made with simple mixing if they are solutions but may need emulsification if in lotion or cream form
- Bleaching powders make in specialist factory due to fire and inhalation risk.
- Safety, safety, safety

Packaging for Hair Bleaching products

- Wide variety esp plastic bottles/sachets. Reactive nature needs compatibility testing and stability testing
- See the packaging sections of 7.8 and 10.5.4
- Powder bleach products are usually in sheets for home or larger plastic bags for professional use. Again, stability tests
- Warning labels and abide by relevant regulations

Evaluation of hair bleaching products

- Assess using natural hair tresses and compare with those produced by various control products by a trained hairdresser
- Emphasis on process time and process temperature
- Carry out salon trials using models with various hair types and a different number of hairdressers.