



DIPLOMA IN ADVANCE SKIN LIGHTENING COURSE



MODULE FOUR

**MELANIN, FUNCTIONS
AND HOW MELANIN IS PRODUCED**

Learning Outcomes

In module three we extensively discussed hyperpigmentation, their disorder, description, location, Etiology and prescription.

In this course we will be digging deep into:

- Tyrosinase inhibitors, their functions and why they are important in skin lightening formulation.
- How to match them in skincare products.
- Melanin, functions and How melanin is produced.

We cannot discuss TYROSINASE INHIBITORS extensively with out a better understanding of Melanin.

The word melanin is derived from the Greek word “Melanos “Meaning black. It is brown pigment formed by a melanocyte.

There are two types of this pigments:

Eumelanin – Brown to Black

Pheomelanin – Yellow Red

WHAT ARE THE FUNCTIONS OF MELANIN?.

- A. Protects the skin against injury from radiation by absorbing the U.V rays.
- B. It is responsible for differences in skin coloration as the amount of melanin transferred to the keratinocytes causes the various skin colors.
- C. Melanin are protect the skin from free radical scavenger, which ultimately protects the skin, it has the ability to filter and reduce penetration of UV through the epidermis the efficiency of melanin has a sunscreen was observed to be between 1,5 sun protective factor and 4 spf ,implying that melanin absorbs 50-75% of UVR.

MELANOCYTES

These are cell responsible for the formation/Production of melanin in the stratum basal layer.

Melanocytes Synthesize melanin and transfer it via dendritic process to neighboring keratinocytes, one out of 10 cells in the basal layers are melanocytes and they are equally distributed in light and dark skins ,
The differences are.

- The productive capacity of the melanocytes
- The extension of dendritic cells ins more advanced
- It contains more melanosomes.

This is why the following part of our body contains more melanin (nipples, genital areas, armpits knuckles and inner thighs.)

HOW DO MELANOCYTES PRODUCES MELANIN.

The Amino-acid tyrosinase is brought to the melanocytes via the blood stream and is converted into melanin by the enzyme tyrosinase to form all form of skin coloring, The production of melanin occurs in the melanosome.which is found inside the melanocytes, The melanosome contains the enzyme necessary for this process.

Melanin is now ready to be spread or diffuse into the epidermis to give the skin its color.

NOTE -The absence of melanocytes can result to a skin condition called vitiligo or albinism.

WHAT CAUSES INCREASE IN MELANIN PRODUCTION.

UV-A rays from the sunlight penetrate into the lower layers of the epidermis and trigger the melanocytes to produce more melanin. Melanin is produced as a defense mechanism.

Sunlight is the major cause of increase melanin production other factors such as hormonal imbalance, aging and inflammation process can trigger it.

SKIN COLORATION IS DEPENDENT ON FIVE PIGMENTS

- Carotene – Found in the stratum corneum, it is the fat of the dermis and the hypodermis, the epidermis itself has a yellow color due to the presence of carotene
- Melanin – Brown pigments is the melanin which is responsible for shades of brown color.
- Melanoid- Black Pigmented substance related to melanin and is diffused throughout the epidermis.
- Oxy-Haemoglobin- This is largely responsible for the reddish coloring of the skin
- Reduced Hemoglobin – Gives a blueish tint to the skin.

WHAT ROLE DO TYROSINASE PLAY IN YOUR SKIN?

Tyrosinase works by oxidizing amino acids called TYROSINE to create melanin in the skin. The enzyme is essentially found in melanocytes, the pigments producing cells.

Tyrosinase helps in controlling and regulating the amount of melanin produced. When your skin is exposed to UV light, tyrosinase in your body produces melanin to prevent UV induced damage.

SOURCES OF TYROSINASE.

Tyrosinase can be obtained from various microbes like bacteria and fungi. Plants and animals. It is used in several industries including beauty, biochemical and pharma.

Tyrosinase can also be used to purify wastewater through their action, plants and insects also use tyrosinase to speed up their wound-healing process.

WHAT ARE TYROSINASE INHIBITORS?

Tyrosinase inhibitors are chemicals that directly or indirectly inhibit the production of melanin in your skin, they treat almost every form of pigmentation.

Tyrosinase inhibitors are used by the beauty industry to prevent hyperpigmentation tanning and other such skin issues.

However, if you are genetically dark-skinned tyrosinase activity cannot be blocked, only melanin produced in excess amount due to external factor such as UV exposure can be inhibited.

WHAT ARE THE SKINCARE INGREDIENTS THAT CAN WORK TO INHIBIT TYROSINASE IN THE SKIN?

1. ALPHA ARBUTIN.

The new super star against the likes of hydroquinone is the Arbutin.

Arbutin has gained serious popularity in the skincare world -and it focused on treating skin hyperpigmentation without any side effect.

This ingredient is a naturally occurring compound found in plants like bearberry, mulberry.

Arbutin is ten times more effective than beta Arbutin and it's derived from hydroquinone but a safer version.

Arbutin can be quite slow in skin brightening in cosmetics-but over time result will be visible - Customers generally needs to be patient while using Arbutin.

WHO SHOULD CONSIDER USING ARBUTIN?

Anybody can use Arbutin especially if you are battling with Acne scarring or Melasma. Pregnant women should not use products with arbutin generally not consider safe.

SIDE EFFECTS OF ARBUTIN

Skin Irritation

Sun Sensitivity

Redness or irritations from an allergic reaction.

BEST WAY TO USE

Arbutin can be combined with Vitamin C, Azelaic acid , kojic and Niacinamide for effective results.

FORMULATION GUIDE

-Water Soluble (Warm or Cold)

-Use at 0.2 -2%

Country of Japan- Origin

Shelf life -3 years from the date of manufacture

2. L-GLUTATHIONE POWDER

L-Glutathione powder (Reduced Glutathione) is a tri-peptide that is consumed internally and applied externally for skin lightening and brightening purposes into water phase of product formulations.

The Effects of L-Glutathione is over rated in organic skincare industry most of the product that claims glutathione is actually clobetasol propionate 0.5% .

L-Glutathione is generally slow and tends to boost the effect of other skin lightening ingredients when combined together.

Solubility-

Water soluble ph range -3.5 -6-6

Not more than 2 % in your formulation.

Compatibility-

It is compatible with giga white ,vitamin C, Arbutin, kojic acid.

But make sure you only use not more than 3 actives in your skincare.

Note: L-Glutathione is unstable in lotion, so must be properly stored.

3. KOJIC ACID

I personally will say kojic acid powder is effective if you source rightly.

Kojic acid is a natural metabolite produced from different types of fungi.

Aspergillus oryzae is one of the fungi from which kojic acid is derived .

Kojic acid is also derived during the fermentation of Japanese food products like soy sauce and rice wine.

Let's look at some few benefits of Kojic Acid:

- Melasma Treatment-dark patches on skin
- Anti-Aging-treats sun-spot
- Scar Lightening -improve the thickness of scar
- Antibacterial benefits-fight wide range of bacteria.
- Anti-fungal effect -treat and prevent fungal infection like ringworm.

Recommended User guide of kojic powder.(2-4%)

Hydroquinone is not a bad skin lightening in fact it's highly recommended by dermatologist if you follow the right usage -

When you work with kojic acid you need 2% kojic -2% hydroquinone and 5% glycolic to effectively treat hyperpigmentation.

WARNING!

Do not use more than 4% of kojic powder as this may lead to severe skin irritation and sensitivity.

CONTRA-INDICATION FOR KOJIC ACID..

Even though kojic is safe -

From experience there are few people who still react to kojic acid (and this side effect can come in form of dermatitis) skin redness, rashes and sometimes swollen skin - However if kojic is used more than its required % in formulation it give your customer dermatitis.

Secondly - I do not advise you use kojic acid for a long time - it can increase sun sensitivity - or best get a very good sunscreen.

Thirdly - kojic acid should not be applied on any broken skin or damaged skin.

Fourthly - if you are prone to allergies stay clear from kojic.

KOJIC DIPLAMITATE

Same benefits except the followings:

- Kojic acid diplamitate is derived from kojic acid and Fatty acid (palmitic acid)
- Kojic acid diplamitate is more stable than kojic powder.
- Recommended usage 5% in your formulation.
- kojic acid - oxidizes - by changing the color of your product to dark brown.
- while kojic powder is stable.
- Product shelf life - 12 months

5. ALPAFLOR GIGAWHITE.

- Giga white is derived from the Alpine plant.
- It is Eco-Cert approved.
- it brightens the skin
- Reduces age spots
- Even skin tone.
- water soluble

Can be added to final formulation at 5%.

Should be incorporated into cosmetic formulation at temperature below 60 degrees Celsius.

To be used at 3-7%

to be stored from direct light at a temperature of 15-25 degree Celsius.

shelf life-24months if properly stored.

stable with in ph. -3-6.5

Compatible with ethanol in concentration up to 50%

Giga white is Compatible with-Sepi white, Arbutin, kojic dip.

Don't use it with products that contains lactic acid or Alpha hydroxy acid.

it ca affect products ph. and trigger itching, irritation.

6. SNOW WHITE.

This product personally to me it's overrated -

Use alone you don't see any effect and I don't believe in it.

It's said to be a Philippines powder -that lightens the skin and clears acne mark.

It's said to improve pigmentation and it's soluble in warm propylene glycol and glycerin. To be use at 1-3%

If you ask my opinion this powder is a waste of money.

7. SEPI – WHITE.

SEPI white is a very good skin lighter which is suitable for all skin types and gives a uniform –even skin color with results as fast as 7days.

Studies have shown that using SEPI white increases skin luminosity and decrease in the number and color of hyperpigmentation spots and it can be combined with niacinamide and AHA.

If 1% SEPI white was combined with 5% niacinamide in a lotion –

Report has it that hyperpigmentation was reduced after 8weeks of usage.

In an 8 weeks study using Sepi white alone shows that 83% of volunteers had more radiant complexion.

And 73% fewer age spot and 100% more even complexion.

In 7days using SEPI white volunteers reported hyperpigmentation was reduced by 24% with skin luminosity increases by 9%.

Another study also shows that 0.2% SEPI white and 2% ascorbyl glucoside, doubles lightening action result in 13% decrease in melanin pigments.

Formulation Rules

–0.2% in combination with another brightener or when use alone do 2% in your heated phase water or oil at 60 degree Celsius.

–it has excellent stability

–Compatibly with Arbutin, hydroquinone, niacinamide, and sunscreen.

Usage –0.2–2%

Ph– 4.0

Water soluble at ph 7–soluble in alcohol and oil

Shelf life –1year from manufacturers date.

8. NIACINAMIDE.

Also known as vitamin B3 and nicotinamide, niacinamide is a water-soluble vitamin that works with the natural substances in your skin to help visibly minimize enlarged pores, tighten lax pores, improve uneven skin tone, soften fine lines and wrinkles, diminish dullness, and strengthen a weakened surface.

Niacinamide also reduces the impact of environmental damage because of its ability to improve skin's barrier (its first line of defense), plus it also plays a role in helping skin to repair signs of past damage.

Niacinamide is uniquely compatible with any of the products in your skin care routine, including those that contain retinol, peptides, hyaluronic acid,

AHAs, BHA, vitamin C, and all types of antioxidants.

Niacinamide also reduces the impact of environmental damage because of its ability to improve skin's barrier (its first line of defense), plus it also plays a role in helping skin to repair signs of past damage. Left unchecked, this type of daily assault makes skin appear older, dull, and less radiant.

You can use from 0-5 % in your formulation.

Water soluble

9. VITAMIN C.

"Vitamin C promotes collagen production, which has the potential to thicken the dermis, diminish fine lines, and is essential for firm, youthful skin,"

Vitamin C is an antioxidant, meaning it protects skin cells from damaging free radicals caused by UV exposure

Vitamin C can also accelerate the production of both collagen and elastin, which help keep the skin plump and firm by inhibiting melanin production, Vitamin C can help fade dark spots and hyperpigmentation.

*Ascorbic acid is highly sensitive to air and light; and to achieve its stabilization in cosmetic preparations, it has been suggested to use ascorbic acid in microencapsulation form, in combination with other chemical moieties such as vitamin-E, by the control of pH and electrolyte concentration and use of stabilizing agents like citric, tartaric, or ferulic acids.



A large number of cosmetic creams and lotions are available in the market containing the derivatives of ascorbic acid (e.g., sodium ascorbate, ascorbyl palmitate, sodium ascorbyl phosphate, magnesium ascorbyl phosphate, THD ascorbate). Although these preparations are chemically stable, they lack the pharmacological activity of ascorbic acid. In the present review, it has been emphasized to consider the importance of various factors involved in the formulation of such preparations to achieve the stabilization of ascorbic acid as such, to maintain its pharmacological activity.

10. MULBERRY EXTRACT.

Mulberry extracts are natural ingredients often used as an alternative to Hydroquinone.

Mulberry extracts are known to help skin. They are widely used by many people all over the globe for purposes of skin lightening.

Significant research has been gathered to prove the anti tyrosinase activity of mulberry plants produces the desirable effects as far as skin lightening is concerned. Furthermore, the extract is known to slow down the ageing process. It contains rich anti-oxidant properties thus making it extremely beneficial for preventing wrinkles formation. As a result, someone who uses mulberry extract will have flawless, silky smooth skin for many years to come.

Mulberry root extract comes from the white Mulberry tree that is native to China, but cultivated in Europe, Japan, Australia and North America.

The extract has been used for centuries in Chinese Medicine. Contains 20% extract dissolved in water and glycerin, preserved with phenoxyethanol.

Colorless to light yellow liquid, characteristic odor. pH ~5, water-soluble.

INCI Name: Glycerin, water, Morus alba root (Mulberry) extract.

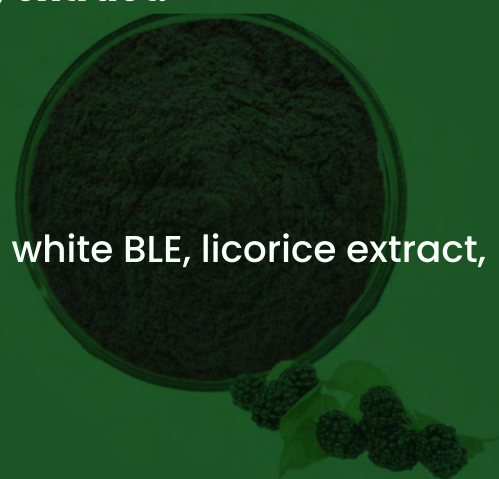
Benefits:

Lightens age spots and uneven skin tone.

Can be combined with other skin lighteners such as skin white BLE, licorice extract, kojic acid, skinwhite msh, and alpha-arbutin.

Very nutritious for the hair and hair roots

Has antioxidant and cleansing properties



Use: Add to formulas to the water phase. Typical use level: 3 – 5%. For external use only.

Applications: Skin lightening products, serums, face creams,

Country of Origin: USA

Raw material source: Morus alba root (Mulberry), glycerin made of naturally derived oils

Manufacture: Prepared via a cold process to avoid potential loss of effectiveness heat processing can have. Created from organically grown, pesticide-free materials which are extracted first with a specified eluant to yield a concentrate. This concentrate is then dissolved in glycerin and water at a concentration of 20% concentrate and 80% diluents.

11. LICORICE.

Produced from the roots and rhizomes of the *Glycyrrhiza glabra* plant, Licorice Root has a long history of use as an anti-irritant and anti-inflammatory. It's been used extensively in Europe and the US as a soothing ingredient in cough suppressants and is often used in Traditional Chinese medicine as an herbal healing agent.

Licorice Root is a multi-functional botanical, whose chief components include the glycosides glycyrrhizin and glycyrrizinic acid, triterpene saponins and flavonoids. Recent research indicates Licorice Root Extract shows promise as a soothing ingredient for the relief of eczema. Studies have shown it may be of benefit in skin lightening products as it contains liquiritin and isoliquertin, flavonoid containing glycosides which induce skin lightening by dispersing melanin pigment and enhancing more even pigment distribution.

12. DEOXY-ARBUTIN.

Deoxy Arbutin demonstrates effective inhibition of mushroom tyrosinase in vitro with a K_i that is 10-fold lower than hydroquinone (HQ) and 350-fold lower than arbutin. In contrast, HQ induced a short but unstained skin lightening effect whereas kojic acid and arbutin exhibit no skin lightening effect.

13.SYM WHITE.

Phenylethyl Resorcinol or more commonly known as 'SymWhite' is both an antioxidant and a skin-lightening agent that is naturally derived from the scotch pine bark tree.

It has an excellent ability to remain stable in most cosmetic formulations making it a highly efficient skin-lightening agent. It is best dissolved in oil or propylene glycol and is stable at a pH of 3.5.

Unlike other powders, SymWhite is highly sensitive to heat and should be mixed at the very last step of a product formulation. The formula temperature must be below

Compatibility

SymWhite is compatible with most skin-lightening actives including SepiWhite, GigaWhite, Vitamin C, L-Glutathione, Kojic Acid, and Kojic Dipalmitate.

To add SymWhite powder to your skin lightening cream or natural brightening lotion, it involves a simple 4 step process.

1.Ensure all your ingredients are ready-Any base cream (skin brightening/lightening lotions work best) .

Then you need your SymWhite powder And Vegetable Oil/Propylene Glycol. You will Mix 1-2teaspoon (about 5-10 grams) in with a small amount of vegetable oil or PG.

Do not use water.

Place the mixture into a stainless steel pot, and use the double boiling method. Place the pot on top of another pot with warm water under heat. Mix, and wait until the powder has fully dissolved with the oil (it should not be grainy or powdery).

Place the mixture into a stainless steel pot, and use the double boiling method. Place the pot on top of another pot with warm water under heat. Mix, and wait until the powder has fully dissolved with the oil(it should not be grainy or powdery).

Add the fully dissolved powder (with the oil or glycol) into your base lotion until it's fully mixed together.

Add a little at a time, until it's all completely absorbed. you have just turned an ordinary brightening lotion, into a potent skin lightening lotion which you can use for at least 6 months.

SymWhite Powder is not known to have any side effects and is generally safe for most people.

However, this product is not intended for internal use.

Do not add the powder to products containing lactic acid, or AHAs as this can affect the end pH of the lotion.

If redness, itching, or irritation occurs, discontinue use immediately.

Use between 2-5%

13. RESVERATROL.

<https://www.elle.com/beauty/makeup-skin-care/a28378301/resveratrol-skin-benefits/>

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6155877/>

14. LEMON PEEL BIOFERMENT.

Optimal skin lightening ingredients for cosmetic products will inhibit melanogenesis. Lemon Peel Bioferment G is ideally suited to meet these requirements. It should be considered for use in skin lightening products and anti-age skin care products to ameliorate age spots and irregular skin pigmentation.

Lemon Peel Bioferment G is the result of macerating whole lemon fruit and incubating it with *Lactobacillus lacti* (the same bacteria used to produce many fermented food products like cheese and sour cream). This ferment is then further processed to remove the potential allergens, citral and geraniol.

The resulting ferment is said to have both anti-tyrosinase and antioxidant activity.

Benefits

Skin lightener

Increased luminosity

Inhibits tyrosinase

Non sensitizing

Not cytotoxic

INCI: Glycerin, Water & Lactobacillus/Lemon Peel Ferment Extract

15. AZELAIC ACID

Azelaic acid is a naturally occurring acid found in grains such as barley, wheat, and rye.

It has antimicrobial and anti-inflammatory properties, which make it effective in the treatment of skin conditions like acne and rosacea. The acid can prevent future outbreaks and clean bacteria from your pores that causes acne.

Uses of azelaic acid for acne

Azelaic acid works by:

clearing your pores of bacteria that may be causing irritation or breakouts
reducing inflammation so acne becomes less visible, less red, and less irritated
gently encouraging cell turnover so your skin heals more quickly and scarring is minimized.

NOTE- If you are a regular smoker, azelaic acid can adversely affect your skin,

• Did you know Azelaic acid was initially used as a topical medicine to treat acne, However due to its ability to inhibit tyrosinase activity, the beauty industry started using it to treat hyperpigmentary disorders like melasma.

16. GLYCOLIC ACID:

Glycolic acid is a water-soluble alpha hydroxy acid (AHA) that is derived from sugar cane. It is one of the most well-known and widely used alpha-hydroxy acids in the skincare industry.

Other alpha-hydroxy acids include lactic acid, malic acid, tartaric acid, and citric acid.

How Glycolic Acid Works

Glycolic acid has the smallest sized molecules of all the alpha-hydroxy acids. Because of these super tiny molecules, glycolic acid can easily penetrate the skin. This allows glycolic acid to exfoliate the skin more effectively than other AHAs

17. BEARBERRY EXTRACT:

INCI Arctostaphylos Uva Ursi leaf powder

Bearberry extract is made from the leaves of the Bearberry shrub (whose berries are a favorite food for bears, hence the name).

It contains the active agent, Arbutin, which naturally lightens and brightens skin.

There are 3 types of Bearberry shrubs but only the common bearberry, arctostaphylos uva-ursi, produces arbutin.

Benefits

Bearberry contains allantoin, which has soothing, skin-repairing properties.

Unlike synthetic hydroquinone, it's non-irritating and suitable for even sensitive skin.

It works as a natural skin whitening and brightening agent to brighten skin tone as well as correcting hyperpigmentation problems like age spots, freckles, melasma, and acne scars. Bearberry contains antioxidants that protect against free radical damage and UV rays.

If an ingredient, for example.

Azelaic acid shelf life is 2years

And salicylic acid 1year.

The shelf life of that product is one year.

Patch products with close shelf-life together.

This is why skincare products must be formulated in tiny batches for Quick utilization. That is why it's called handmade products, and the idea is to produce small.

If you want to do large manufacturing, you will have to use ingredients with longer shelf life.

18.HYDROQUINONE

Hydroquinone works by decreasing the number of melanocytes in your skin, it is a skin lightening and bleaching agent. It is usually sold in 2% concentration over the counter.

Historically, there's been some back-and-forth on the safety of hydroquinone. In 1982, the U.S. Food and Drug Administration recognized the ingredient as safe and effective Trusted Source.

Several years later, concerns about safety prompted retailers to pull hydroquinone. Hydroquinone bleaches your skin by decreasing the number of melanocytes present. Melanocytes make melanin, which is what produces your skin tone.

In cases of hyperpigmentation, more melanin is present due to an increase in melanocyte production. By controlling these melanocytes, your skin will become more evenly toned over time.

It takes about four weeks on average for the ingredient to take effect. It may take several months of consistent use before you see full results.

• **What Skin Conditions Can Benefits From Hydroquinone.**

Hydroquinone is used to treat skin conditions related to hyperpigmentation. This includes: -Age spot, Freckles, Melasma, Post inflammatory hyperpigmentation, Although hydroquinone can help fade red or brown spots that have lingered, it won't help with active inflammation. For example, the ingredient can help minimize acne scarring, but it won't have an effect on redness from active breakouts.

• **Is it safe on all skin types?** Although hydroquinone is generally well-tolerated, there are a few exceptions.

If you have dry or sensitive or sensitive skin, you may find that hydroquinone causes further dryness or irritation. This usually tapers off as your skin adjusts to the ingredient. People who have normal or oily skin are less likely to experience these side effects.

• How to use hydroquinone?

Consistency is key to treating hyperpigmentation. You'll want to use this ingredient every day for maximum results. Follow all product instructions carefully.

It's important to do a patch test before your first full application.

This will allow you to determine how your skin will react and whether it results in unwelcome side effects.

To do this:

- Rub a small amount of the product into the inside of your forearm.
- Cover the area with a bandage.
- Wash your hands to prevent the product from staining your clothes or other materials.
- Wait 24 hours.
- Discontinue use if you experience severe itching or other irritation during this time.

If you don't experience any side effects, you should be able to safely add it to your skin care routine. You should apply it after cleansing and toning, but before your moisturizer.

Take just a small amount of the product and apply it evenly across the entire area of skin. Gently massage into your skin until it's completely absorbed.

Make sure you wash your hands after use — this will prevent the product from affecting other areas of skin or staining your clothes and other materials.

You should also wear sunscreen while using this ingredient. Sun exposure can not only make hyperpigmentation worse, but also reverse the effects of your hydroquinone treatment.

Sunscreen is usually the last step of a skin care routine. Be sure to reapply as needed throughout the day.

While consistency is important for maximum results, you shouldn't use it for long periods of time. If you don't see any improvement after three months, discontinue use.

If you do see improvement, you can use the product for up to four months, and then begin to taper off use. You shouldn't use it for more than five months at a time.

If you want to begin using the product again, wait two to three months before you resume use.

• Possible side effects and risk of hydroquinone

To date, hydroquinone is deemed safe in the United States. There isn't any clinical evidence Trusted Source currently to suggest that hydroquinone is harmful to humans.

However, minor side effects are still possible. It may cause a temporary uptick in redness or dryness at first, especially if you have sensitive skin. These effects should fade as your skin becomes used to the product.

In rare cases Trusted Source, hydroquinone has caused a condition called ochronosis. It's marked by papules and bluish-black pigmentation.

This can occur after prolonged daily use. As such, you shouldn't use products with this ingredient for more than five months at a time.

POST INFLAMTORY ERYTHEMA (PIE)	Tranexamic acid, Azealic acid Niacinamide Sodium Ascrobyl Phosphate
SUN SPOT AND MELASMA	L, ascorbic acid, Kojic acid Phytic acid, Resorcinols AHA's Alpha Arbutin Hydroquinone
POST INFLAMMATORY HYPERPIGMENTATION	As above. AHA'S +BHA Licorice root

19. WHAT ARE ALPHA HYDROXY ACIDS?

Alpha hydroxy acids are popularly used to treat dullness, pigmentation aging skin and acne, some frequently used AHA's include glycolic acid, lactic acid, mandelic acid, however glycolic is highest strength of them out all it has the smallest molecule structure and penetrate faster and deeply into the skin.

From 5-15% of this acid can be used in product formulation.

Citric acid and tartic acid are not frequently used at higher concentrations they are mostly ph. adjusters.

AHA are water soluble means they are hydrophilic ,they work best at ph conditions around 3-6-3-8(they are safer and more effective).

Mechanism action of AHA

Studies shows that AHAs can improve the appearance of uneven skin texture, pigmentation and fine lines, AHA helps breakdown pores-clogging skin cells that sit on the surface of the skin, in lowest concentration of 2-5% glycolic acid is believed to facilitate progressive weakening of the stratum corneum resulting in uniform exfoliation of its outermost layer of the stratum disjunctivum .

This does not disrupt the barrier function of your skin because glycolic acid formulation at lower concentration are like lactic acid ,they provides hydration to the skin.

Caution of AHA

- They can increase photo sensitivity and should be used with sun protection best to be used in evening.
- Do not use alongside retinoids and avoid excessive sun exposure when you use higher concentration

20 . MANDELIC ACID.

Mandelic acid is a large molecule alpha hydroxy acid with slow epidermal protection.

Mandelic acid is a larger molecule than glycolic acid which makes it best tolerated AHA on the skin

Mandelic acid is best for treating post inflammatory hyperpigmentation and also contain anti-bacterial properties which glycolic do not have

It is a gently exfoliant that aids in desquamation of the upper layers of the stratum corneum .

Aside the active treatment mandelic acid is often used in skin rejuvenation and lightening products especially darker skin tones

Research also concludes that mandelic acid is an appropriate treatment for a wide variety of skin pathologies, from acne to wrinkles, it is especially good in the treatment of adult acne .

-Mandelic acid can be layer with other anti-aging pigmentation ingredients

- But not to be layered with retinol up to 12% can be sued.