

# CHEMISTRY OF COSMETICS



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# WHAT IS COSMETICS?

They are care substances used to enhance the appearance or odor of the human body. They are generally mixtures of chemical compounds, some being derived from natural sources (such as coconut oil, bee-wax) and many being synthetics.

# COSMETICS AROUND US



# HISTORY

- ❖ Egyptian queen Cleopatra bathed in milk, as a way to keep her skin beautiful and soft. It is proven that **lactic acid** – one of milk's chemical compound – acts on the deeper layers of the epidermis, promoting the removal of dead cells and skin renewal.
- ❖ In ancient Greece, three thousand years before Christ, women used powdered lead carbonate to make their faces paler.
- ❖ In ancient Rome, woman was using skin creams made from beeswax, olive oils and rosewater.



# MAJOR CHEMICAL COMPOUNDS USED IN COSMETICS

- **GLYCERIN** is found naturally in skin and is added to skin creams to increase hydration.
- **PARABENS** (including butylparaben, methylparaben, etc.) are preservatives. Used widely in up to 70 percent of makeup, skin products, and other cosmetics, they prevent spoilage and inhibit bacteria and fungi.
- **SODIUM LAURYL SULFATE** is a surface-active substance used most often in shampoo, but it is also used in skin cleansers. It loosens dirt and oils, making it easier to wash them away.

# CONTD..

- **TALC** is one of the primary ingredients in powdered cosmetics like eye shadow and blush. It is an absorbent natural compound that comprises silicon and magnesium.
- **GLYCOL STEARATE** is a thickener added to products like shampoos to give them a pearly or opalescent look. It doesn't change how the product works, but it makes it look appealing.
- **DIMETHICONE** is a form of silicone. Used often in hair products, it makes the product slippery and spreadable.
- **TITANIUM DIOXIDE** is used to thicken and lighten cosmetics like foundation, blush, and eye shadow.



# CONTD..

- **LANOLIN** is a protein derived from sheep's sweat glands. It's a high-quality moisturizer that's especially effective for people with dry or sensitive skin. Chemically, it's very similar to oil produced by human sebaceous glands.
- **MICA** is a reflective mineral that's used in makeup products and sometimes toothpaste.
- **PANTHENOL** is a form of vitamin B5. In hair products, it seals the hair shaft, making strands soft and shiny. It's sometimes used in skin ointments that treat burns or irritation because it can reduce inflammation and healing.

# WHAT DO COSMETICS CONTAIN?

Most cosmetics contain a combination of at least some of the following ingredients:

1. WATER
2. EMULSIFIER
3. PRESERVATIVE
4. THICKENER
5. COLOR
6. FRAGRANCE
7. pH STABILIZERS



# COMMON COSMETICS

# HAIR DYE / COLOR

**HYDROGEN PEROXIDE** (also known as the developer or oxidizing agent) -- This ingredient, in varying forms and strengths, helps initiate the color-forming process and creates longer-lasting color. The larger the volume of the developer, the greater the amount of sulfur is removed from the hair.

**AMMONIA** -- This act as a catalyst when the permanent hair color comes together with the peroxide. Ammonia tends to separate the cuticle and allow the hair color to penetrate the cortex of the hair.

# ADVERSE EFFECTS

- **Asthma:** Studies have shown that those susceptible to lung inflammation will be at increase risk for the development of asthma when using commercial hair dye. Ammonia is another common contributor to asthma attacks when using hair dye.
- **Severe Allergic Reaction:** There are at least a dozen different chemicals in hair dye that can cause a severe allergic reactions. It's one of the reasons the instructions on the inside of the box advise you to do a "patch test" first.

# CONTD..

- **Non-Hodgkin's Lymphoma:** Dying your hair can lead to the development of Non-Hodgkin's Lymphoma. Non-Hodgkin's Lymphoma is cancer of the lymph tissue. This cancer is often found in the lymph nodes, spleen, and bone marrow.
- **Multiple Myeloma:** Men who use hair dye every once in the while to cover up the grey may still be at risk for developing this cancer of the bone marrow. According to research, multiple myeloma risk was greatly increased in males who used commercial dye products.

# TALCUM POWDER

Here is the list of chemical compounds that constitute talcum powder.

Silicon dioxide

Magnesium oxide

Calcium oxide

Iron(III) oxide

Zinc oxide

Aluminum oxide

Benzoin

Calcium carbonate

# ADVERSE EFFECTS

- The International Agency for Research on Cancer states that talc containing asbestos is a carcinogen to humans.
- The chemical ingredients in talc, like silicates, are finely ground, that are easily carried by the air, and can reach our lungs.
- Lung problems may result from talc inhalation by babies.
- In women, it can also cause ovarian cancer.

# LIPSTICKS

- Lipsticks are generally made by combining a water-insoluble dye with wax and a non-volatile oil (beeswax with castor oil is a common formulation).
- This results in a substance that is stiff, but will spread easily on your lips. Because it's water-insoluble, the lipstick won't be dissolved by saliva or by the drink you're sipping.
- Some lipsticks also use dyes which react with the amino acids in the protein of your skin - this is why some lipsticks appear blue or green in the tube, but turn a deep shade of red when applied to your lips.



# ADVERSE EFFECTS

- Don't get mislead by the glow; the lipstick which used to give a shinning look to you lips might have had a large amounts of lead ...“Lead on lips can lead to Lead Toxicity”.
- Lead can bind and react with the proteins and molecules and cause a terrible effect in human body.
- Many metals like Al, Cr, and Cd found in lipsticks but unfortunately none of them listed in product description.

# DEODORANTS

- Deodorant products counteract the formation of unpleasant body odor. They principally work by controlling the growth of bacteria on the skin surface but also contain perfume which can help overcome body odor and give a pleasing fragrance.
- The following is a detailed list of dangerous chemicals commonly found in non-natural deodorants and antiperspirants: **Aluminum, Parabens, Propylene Glycol, TEA & DEA, FD&C colors.**

# ADVERSE EFFECTS

- Parabens can throw off your body's hormonal balance. This can cause risk of hormonal cancers, and even birth defects in your future children.
- Propylene glycol is a neurotoxin and skin irritant. It could cause damage to your central nervous system, heart, and liver.
- Triclosan has been linked to a number of different problems including: disruption of the endocrine system (particularly thyroid function), increased risk of cancer, and increased hay fever and allergy symptoms.

# ANTI-AGEING CREAMS

- As we age, the turnover of our skin cells reduces, and anti-ageing creams regulate this turnover.
- The most common anti-aging cream ingredients :
  - 1.**Peptides**: It enables the skin to maintain its smooth, plump and youthful appearance.
  - 2.**Alpha-hydroxy acids**: They getting rid of dead skin cells, allowing new cells to grow.
  - 3.**Retinol**: Reducing the appearance of wrinkles and boosts the thickness and elasticity of the skin
  - 4.**Antioxidants**: Antioxidants are commonly claimed to help fight cell damage from free radicals.

# ADVERSE EFFECTS

- Many anti-ageing creams contain carcinogenic chemicals such as DEA, TEA and MEA, which are used to maintain the pH level of the cream. Over exposure to these chemicals may cause cancer in the liver and kidneys.
- Usage of some anti-ageing creams may lead to the formation of red patches and blisters on the skin followed by irritation.
- Parabens used in these creams may increase the shelf life, but prolonged use may lead to the formation of rashes on the skin.

# SUNSCREEN

In the late 1970's and early 1980's, many makeup manufacturers added sunscreens to their products in response to consumer concerns about skin cancer and other skin-damaging effects of excessive sun.

Compounds that screen out harmful ultraviolet light include **para-aminobenzoic acid (PABA)** and its derivatives, as well as **benzophenones** such as **oxybenzone** and **dioxybenzone**.

# ADVERSE EFFECTS

- Oxybenzone is one of the most troublesome ingredients found in the majority of sunscreens. Its primary function is to absorb ultraviolet light. However, oxybenzone is also believed to cause hormone disruptions and cell damage that may provoke cancer.
- Parabens kind of synthetic preservatives known to interfere with hormone production and release.



# MOISTURIZERS

- Moisturizers are generally used to treat dry, scaly skin.
- Moisturizers can correct this problem in two ways: by preventing further moisture loss and by adding substances that increase the water-holding capacity of the skin.
- Moisturizers may contain oils such as isopropyl palmitate, stearyl alcohol or light mineral oil. The oils form a waterproof layer on the skin, reducing evaporation and allowing the body's natural process of rehydration to return the skin to a normal water level.

# ADVERSE EFFECTS

- Rashes on skin.
- Inflammation and irritations.
- Moisturizers actually increase the skin's susceptibility to drying out early and easily.

# CONCLUSION

- Please minimize the use of cosmetics, As we know that they are complex mixture of chemical compounds, so health related issues are always be there, but they are needed for good personal hygiene & care in todays fast moving life.
- Whenever you want to buy any cosmetic, do lot of market research, try to find about product on “Google”.
- Always go for quality and branded product.

# CONTD..

The best solution is go for natural, home-made products, our kitchen has many stuffs that will help you to keep young and beautiful.



# THANK YOU !!!

IN OUR PURSUIT OF BEAUTY, IT IS WISE TO READ THE LABEL AND UNDERSTAND WHICH INGREDIENTS ARE USED IN A PRODUCT ARE HELPFUL WHEN PUTTING ON YOUR BEST FACE.