



QUALITY CONTROL OF RAW MATERIALS USED IN COSMETICS

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ABSTRACT

Cosmetics, like any product containing water and organic/inorganic compounds, require preservation against microbial contamination to guarantee consumer's safety and to increase their shelf-life. The microbiological safety has as main goal of consumer protection against potentially pathogenic microorganisms, together with the product's preservation resulting from biological and physicochemical deterioration. This is ensured by chemical, physical, or physicochemical strategies. The most popular tactic relies on the use of antimicrobial agents, which can be obtained from synthetic, natural, or even multipurpose materials. Good manufacturing procedures (GMPs), raw material management, and appropriate methodologies, such as the challenge test, are currently followed in the evaluation of the preservation system to verify its preservative effect. Although they are poisonous to consumers, using them at high quantities is actually more beneficial from a preservation standpoint, as using them at low doses can lead to the development of microbial resistance.

Keywords: Preservative effectiveness, harmful effects, microbiological safety, consumer protection, and synthetic antimicrobial agents in cosmetics

INTRODUCTION:

The Greek term KOSM TIKOS, from which the phrase is derived, means powerful, arranged, skilled in decorating. FDA states

that products meant to be rubbed, poured, sprinkled, sprayed, injected into, or applied in any other way to the human body are meant

to be used for cleaning, beautifying, enhancing attractiveness, or changing appearance.

The earliest indications of cosmetics were discovered in ancient Egypt circa 4000 B.C. Between the 15th and 16th centuries, Italy and France emerged as the primary hubs for the production of cosmetics [1-3]. France started combining elements to produce new

scents and cosmetics.1930s: Chemists were employed by manufacturers in their quality control and development labs. The British government began licensing cosmetic and toiletry industries in 1940. The Perfumery Manufacturers Association was established in 1945.1960sand 1970s: Grew up in the UK, the USA, and the rest of Europe.



Figure 1: Cosmetics

CLASSIFICATION OF COSMETICS:[4]

Table: 1 Type of cosmetics



RAW MATERIALS USED IN COSMETICS:

1. ANTIBACTERIAL AND PRESERVATIVES:

Most commonly, the word "antibacterial agent" refers to chemical substances found in household or cosmetic goods either bacteriostatic or bactericidal action to give the goods protection by acting as an effective

preservative against microorganisms [5-8]. First antimicrobial products: soap bars made from soap bars with deodorant. The goal is to reduce the skin's microbial flora in addition to cleaning it. Three types of opioid antibacterial products are distinguished. Hand wash with antiseptic. Prior to surgery, the patient Surgical hand cleansing skin preparation.



Figure: 2 Soap bars

Topical antimicrobial products:

Triclocarban (TCC): TCC is the active ingredient in the majority of antimicrobial soap bars.

Formaldehyde: Traditionally, formaldehyde was used to prepare antibacterial soap bars. While these proved to be highly efficient for usage in hospitals, formaldehyde use decreased because of toxicity concerns [9-10].

Triclosan: Triclosan is used in the formulation of no more than 1% of liquid soaps. Frequent usage of triclosan and TCC,

FDA held extensive discussions.

2. WATER:

Mostly, it is a commonly used raw element in the production of cosmetics. Water is a common solvent for many cosmetics components. Membrane filters for filtration (0.2 microns) [11-14]. Deionized water is created via distillation or double distillation, which uses resins to remove anions and cations in an ion exchange system. Resins used to make columns have the ability to renew.



Figure: 3 Water

3. COLORANTS:

When colouring ornamental cosmetics, a few

key ingredients are needed. These materials dissolve in a medium [15].

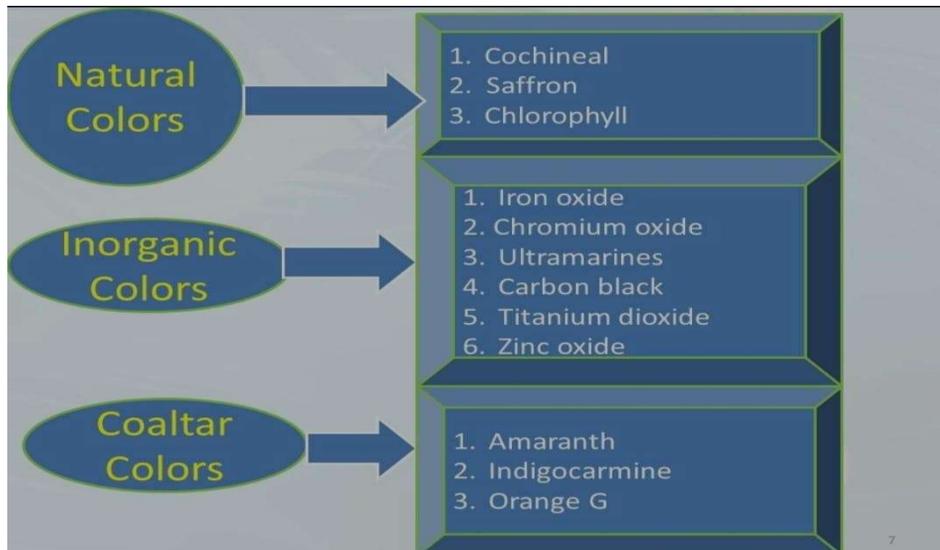


Figure: 4 Types of colorants

Type of Coloring agent	Cosmetic product used
Water soluble colorants	Bath products, creams, soaps, toothpastes and gels
Oil Soluble Colorants and pigments	face make up , lipsticks, soaps
Color lakes	Eye make up, Lipsticks.
Water dispersible pigments	Soaps

Figure: 5 Types of coloring agent

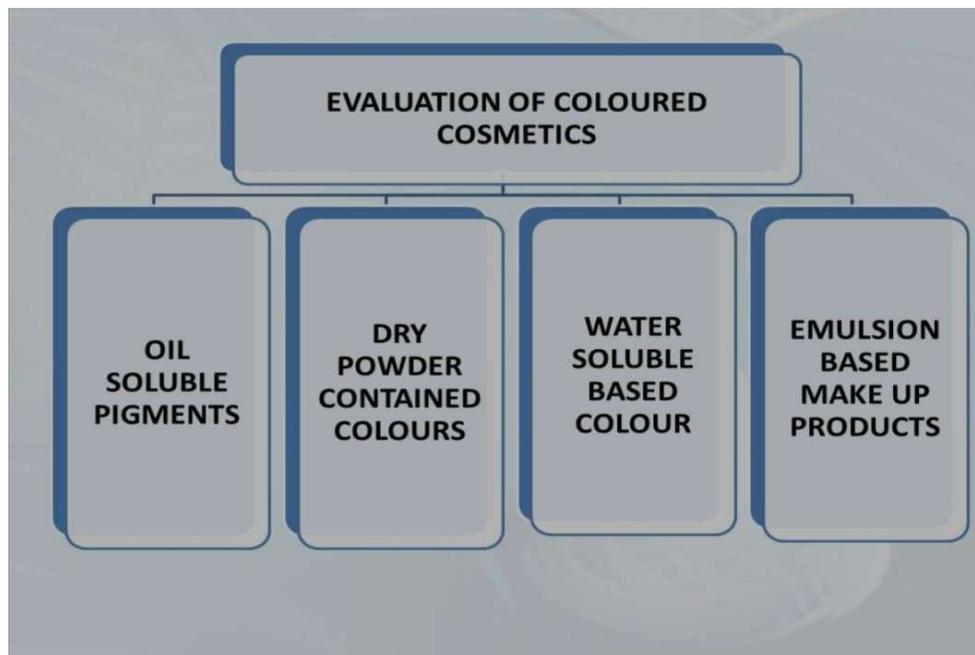


Figure: 6 Evaluation of coloured cosmetics

4. SKIN FEEL AGENTS:

The components that give a skin care product sensory quality, evoking pleasurable feelings both during and after usage [16-17]. It consists of silicones, water-soluble polymeric compounds, lipophilic materials, and its cationic derivatives. Classification of CFTA Occlusive materials; emollients unspecified substances.

Emollients: It is a cosmetics component that aids in preserving the skin's smooth, silky appearance. It is produced through chemical synthesis or natural origin [18].

Emollient categories common substances

Non-polar substances: (Paraffins and Iso-Paraffins) Polar substances: (Triglycerides and Esters)

Since these classes consist of: Lipids, Oils, Esters of fatty acids, Derivatives of Lanolin,

Silicones.

Lipids:

Hydrophilic lipids – For preparations including foamy skin washing, it is recommended [19-21]. Propylated fatty alcohols, low ethoxylate Triglycerides ethoxylated monomers and di glycerides, and ethoxylated glycerides are among them.

Lanolin: It is taken out of the grease from sheep's wool. It's a complex mixture of lanolin alcohol as well as lanolin fatty acid esters with high molecular weight [22].

Silicon derivatives: It is mostly found in products that cleanse the body. Included in it are Dimethazone's Cyclomethycaine found in liquid cleansers and Dry emollients.

(ii). **Occlusives:** It is frequently found in liquid skin care formulations. Among them are vegetable oils [23-24]. Triglycerides

Wax, natural or artificial, Esters of fattyacids, Lanolin and its by-products.

(iii). Miscellaneous substances:

Humectants – It is an element used in cosmetics that aims to make the uppermost layers of skin more water-rich. Glycerine, propylene glycol (PG), sorbitol, and xylitol.

5. HYDRATING SUBSTANCES:

They are incorporated into cosmetics to slow down the product's loss of moisture while it is being used. Humectants and hygroscopic chemicals are typically responsible for increasing the amount of moisture content in materials. Dry skin and hair are the targeted regions.

Classification of Chemicals: Butylene, glycerine, lactic, propylene, sorbitol, urea, panthenol, glycol, acid, and carbohydrates.

Butylene glycol: It is utilized in topical applications as a humectant. frequently found in setting lotions and hair sprays.

Glycerine: It is utilized as a lubricant, sweetener, plasticizer, solvent, and preservative. Because moisturizers with 20–

25% conc are used to address dryskin issues.

Lactic acid: In topical treatments, it is utilized. Additionally, it is used to treatacne, keratosis, dandruff, and dry skin [25-26]. Additionally, it enhances the skin's clinical appearance.

Panthenol: It is an alcohol that is changed into D-pantothenic acid in tissues. Its calming and moisturizing qualities make it a popular ingredient in cosmetic products. It can be found in topical skin healing and sunburn treatments.

Propylene glycol: It is extensively employed as solvent and container in theproduction of cosmetics. It helps with hypersensitivity reactions and skin irritation. It has been utilized to treat a variety of skin conditions.

6. MOISTURIZERS:

These materials are typically hygroscopic and polar in nature. Glycerine is an extremely economical substance. Aloe is a great moisturizer since it has a combination of minerals, carbohydrates, and polysaccharides [27].



Figure: 7 Moisturizer

7. THICKNERS:

By adding just enough wax to a light lotion. It is possible to produce a thick cream. Polymers comprise many thickeners [28].

Cosmetic thickeners: locust bean gum and carrageenan pectin These are some instances of thickeners used in cosmetics.

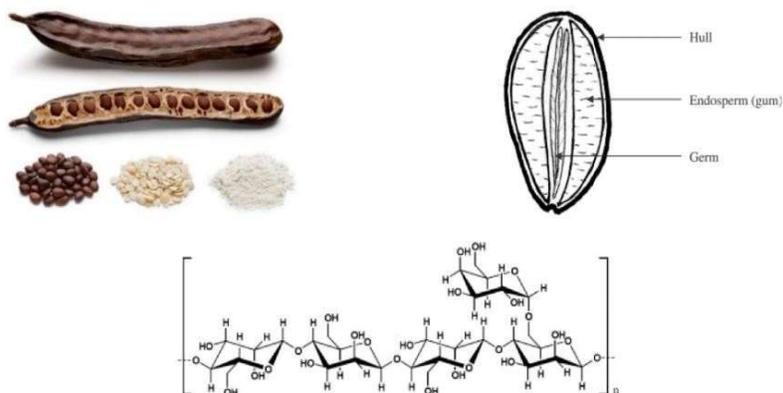


Figure: 8 Locust beangum and carrageenan pectin

8. ACTIVE INGREDIENTS:

Active ingredients are substances that operate physiologically on the skin. In order to shield our skin from the environment, some active ingredients have been included to skin treatments. Benzoyl

peroxide and salicylic acid are essential components. They possess the capacity to pierce skin. Alpha hydroxy acids, which are fruit acids, are an example of an active ingredient.

FRUIT ACIDS	
 Citric acid	$C_3H_4OH(COOH)_3$
 Malic acid	$C_2H_3OH(COOH)_2$
 Folic acid	$CHOH(COOH)_2$

Figure: 9 Types of fruit acids

9. SUNSCREENS:

Sunscreens are a group of substances that shield the skin from ultraviolet light. Depending on the wavelengths that they

absorb, they are categorized. A typical water-soluble filter used to preserve the colour of cosmetics is benzophenone 4. [29]



Figure: 10 Sunscreens

10. PRESERVATIVES:

Tocopherol, or vitamin E, is one example of an antioxidant that is added to help stop oxidation. to shield the skin from harm caused by free radicals.

Categories of preservatives

Organic acids, Alcohols, Aldehydes, and Phenolic compounds

(i). **Organic acids** – Benzoic acid, Salicylic acid

(ii). **Alcohols** – Ethyl alcohol, Isopropyl alcohol

(iii). **Aldehydes** – Formaldehyde, Cinnamic aldehyde

APPLICATIONS:

Wax esters, ester oils, oils, and fats are examples of the oily raw materials utilized in the cosmetics industry. Surface-active agents serve as solubilizing agents, emulsifiers, and

other purposes. Along with vitamins, moisturizing agents, thickening agents, film formers, and polymers are utilized as powders, antioxidants, ultraviolet absorbents, and colouring agents [30]. Oil is a common ingredient in cosmetics because it may breakdown lipids. Emulsification, solubilization, diffusion, wetting, dispersion, cleaning, and other processes all make use of this surface activity.

CONCLUSION:

These materials can be used to produce structural and functional constituents for cosmetics. The fundamental functioning of the products is guaranteed by functional components. These consist of emollients, water, and surfactants, among others. Emollients are substances that soften and condition the skin of makeup.

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