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Introduction to Cosmetics

In 21st century, the winds of changes in the society are blowing forcefully in all parts of world for application of cosmetic. Cosmetic word is originated from Greek word “Kosmeticos” means adorn and preparation, which is used for this purpose, is known as cosmetic. We can define the cosmetic as “Cosmetic are external preparation meant for to apply on external part of the body i.e., nails, skin, hair for coloring, covering, softening, cleaning, nourishing, waving, setting, mollification, preservation, removal and protection” etc. We can also define it as “A cosmetic is an item intended to be rubbed, poured, sprinkled or sprayed on, introduced in to or otherwise applied to the human body or any part thereof for cleansing, beautifying, promoting attractiveness or altering the appearance”.

All cosmetic preparation has their application for long or short periods to beautify the body as well as to keep the body healthy up to some extent and has psychological impact to other. The “active life” of any cosmetic preparation begins the moment it is brought in contact with the skin/hair/teeth/or nails and ends when it is removed or has evaporated. During it is active life; it has intimate reciprocal relationship, which results, cosmetic changes on the body. The cosmetic product prevents its outmost layer from drying out, penetrate below the external layer and introduce active substances in to deep lying strata or adhere only superficially to change color or luster of areas. The cosmetic which are used for decorative purposes, i.e., eye lines, rouges, mascara, face masking preparations etc and also carries the inherent risk of desirable side effects. It may inhibit important physiological process, chemically modify certain skin constituents (e.g., in case of bleaching and coloring preparations), and contribute towards their removal or even give rise to certain allergic reactions.

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In modern cosmetology, the all products of cosmetic preparations manufactured under strict quality control conditions to achieve an absence of claims on both appearance and packing. There is varieties of cosmetic preparations are used which can be classifying by various ways :

(a) According to region, where it is use :

- (i) *Skin* : Powder, Lipstick, Rouge, Creams, Lotions and Solutions etc.
- (ii) *Hairs* : Shampoo, Conditioners, Creams, Bleach, Coloring preparation etc.
- (iii) *Nails* : Nail lacquers, Lacquers removers etc.
- (iv) *Teeth* : Powder, Paste, Gel and Dentifrices etc.
- (v) *Eye* : Eyeliner, Mascara, Eye shadow and Eyebrow pencil etc.

(b) According to function of cosmetic preparation :

- (i) *Emollient Preparation* : Cold creams, Vanishing creams, Foundation creams, Lotions and Solutions etc.
- (ii) *Cleansing Preparation* : Creams, Shampoo and Rinses etc.
- (iii) *Decorative Preparations* : Lipsticks, Rouges, Eyeliner, lacquers and Dressing preparations.
- (iv) *Deodorant / Antiperspirant* : Spray, Sticks and Mouthwashes.
- (v) *Protective Preparations* : Creams and Powders.
- (vi) *Preparation for Enjoyment* : Salts, Powders, Oils and Milks.

(c) According to composition of cosmetics :

- (i) Powder
- (ii) Lotions
- (iii) Emulsions
- (iv) Solutions
- (v) Suspensions
- (vi) Creams
- (vii) Paste
- (viii) Gels
- (ix) Aerosol
- (x) Sticks
- (xi) Pencils

A wide variety of cosmetics are available in the market. So, therefore, the knowledge of various cosmetics and their relative applications are given in this book.

Face Packs

Face packs are the preparations, which apply topically to facial area having high affinity to keratin and remain on skin surface. It is used for the purpose of achieving tightening sensation and a cleaning effect in the area of application. It adheres to skin surface and easily rubbed off. These are high viscosity or paste forms exemplified by the “Clay facial packs” and once fashionable “Mud packs”. In general, they contain colloidal clay, kaolin or other suitable solids dispersed in a liquid vehicle. The desired plasticity is determined by concentration of solids.

The preparation is applied on facial area in lay thin film, 1/16” thick depth and allows remaining undisturbed until the evaporation of the water is substantially complete such evaporation may be hastened by forced ventilation. The loss of water causes the packs to harden and contract. The desired cleaning effect is due both the adsorptive efficiency of bentonite and to the process of removing the hardened pack. Regarding the removal of packs, it should prevent a complete dehydration of pack film should consist of humectants i.e. glycerol, to maintain plasticity of film sulfonated oils are used which also enhances cleaning efficiency.

There are other materials used in packs, for example, Alumina, Fuller’s earth, Bone carcall and Kieselghur for its cleaning activity by adsorptive efficiency. Soluble colors are used to tint preparations as well to provide esthetic shades.

Now a day, in the formulation of “cleaning packs” special attention is paid to the inclusion of slightly abrasive ingredients in non-drying vehicle. The user applies the product by gentle massaging it into the skin after which is allowed to remain for a 10 – 20 minutes period. It is then removed, with the aid of a moistened towel. The ingredient used in such type of preparations are grain meals offering a wide latitude in particle size as well as intrinsic hardness, opacifier like Zinc Oxide, Titanic Dioxide and other metals like filtered honey crushed almond and preservatives.

Face Mask

Face Mask is the preparations, which are used to mask the skin imperfection and shininess. The skin imperfection are mainly red, rose, red spots, freckles, small birth marks, enlarged follicle mouth, scars of pervious skin lesions, wrinkles, exceptionally developed sebaceous and sweat gland etc. which can be mask by such type of preparations. These preparations generally have low viscosity and easily poured from the containers. All well formulated products should have some of the characteristics as follows:

1. It should produce allow ease of application and removal.
2. It should achieve their result without requiring under time drying.

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3. It should be non-sensitizing and non-irritating to normal skin.
4. It should give superficial and mechanical effect to skin

Liquid mask are usually formulated around the film forming characteristics of one or more of the hydrophilic colloids like clay type components. They also have very satisfactory cleaning action by the inclusion of a small very satisfactory cleaning action by the inclusion of a small amount of mild but effective detergent. The masking effect is achieved with face powders, foundation creams and liquid make-ups and as auxiliary, day creams. Such type of preparation mainly covers the skin by a thin invisible film on the facial area. These preparations include basic powder material with adherent like opacifiers, colors and perfumes to provide smooth and shiny film.

Cold Cream

Historically the “Cold Cream” was known as “Ungerentum” or “Ceratum Refrigerence”. Cold creams system is first reported by Galleon. It is water in oil type emulsion system with borax – bees wax combination as emulsifier. A protective film remains on skin following evaporation of water. The slow evaporation of water gives a skin cooling effect, so that it called “Cold Creams”. These are used for cleaning, moisturizing, protective and also as sun screen creams. Cold creams become harder and more lustrous, the more oil it contains; with more water, it becomes softer. If it contains more than 60% of mineral oil it tends to bleed vegetable oils, occasionally make the creams granular. A smooth consistency of cold creams can be achieved by reducing warm component or adding lanolin or absorption base. It contains 10 – 20% of wax and above it, cream become ductile and salve like; spermaceti, kerosene and paraffin wax make it gloss where as lanolin provides softness. High melting waxes may provide bleeding of water during cooling process.

During the manufacturing of cold cream, temperature should be controlled to prevent discoloration, granule formation and bleeding of oil or water. Most commonly used perfume in cold cream is ‘Rose’, because it masks the fatty odor and no irritation effect. Cold cream frequently is referred to as a mixed emulsion, since oil in water as well as water in oil globules are present. Officially the cold cream is listed in United State Pharmacopoeia e.g., Rose water in USP and in NF XII.

Vanishing Creams

Vanishing creams are so termed because upon application and rubbing in to the skin, there is little or no visible evidence of their former presence. It forms a thin invisible film on skin followed by evaporation of water resulting non-glossy appearance. The basic nature of vanishing cream is oil in water emulsions, which are water removable because it contains o/w emulsifier. There two types of vanishing creams are available in markets; one is light

vanishing cream, which have low binding capacity to powders and other heavy vanishing creams, which have strong capacity to bind with powders. Heavy vanishing creams are known as foundation creams, which are used as skin care product.

Cleansing Creams

Keeping the body clean is the first and most primitive demand on personal hygiene. The healthy body participates in the cleansing process just as it does in protecting itself against external disturbances. The cleansing creams remove visible soil from skin, hair and nails and dried perspiration's or removals of cosmetic preparations that makes the hair and skin sticky. The surface impurities of skin penetrate the corneal layer to some extent, that is removed by the skin in constant strengthening of the uppermost horny cells and rubbed off by normal activities of the body. The skin resident flora also assists in the degradation and removal of organic impurities. But such type of cleaning is not enough as cosmetic point of views, so we use the cleansing preparations like creams and lotions.

The cleansing preparation contains mainly soap with other adjustments like SAA, solubilizing agents, swelling agents, absorbents. There are two types of cleaning preparations are available in markets. One is water based skin cleansing and another is oil-based skin cleansing preparation. The mechanism of skin cleansing is mainly by dispersing the surface foreign materials in oil and water emulsion and then rinse off by several washings without water. Oily creams solubilize the foreign particles and some of the cleansing creams absorb the surface soil then rinse off with water.

After Shave Lotions

After-shave lotions relieve the feeling of tautness and discomfort caused by shaving. It is use to refresh, cool the skin, smooth minor irritations and impart the feeling of well being. There are varieties of after-shave lotions available in market, i.e., clear lotions, stick lotions and gels, creams and emulsified lotions. Some other types of after-shave preparations also available like powders, pencils, alum blocks and aerosols etc. Such formulations have one or more special characteristics, which dictate the physical form of the product and relative efficiency when used after different types of shaves.

Fragrance feels continue to be primary considerations in the formulation of after-shave. Its formulation also consider mild astringency, neutralization of soap left on skin to help restore normal acid mantle and anti bacterial action. Most of the after-shave lotions contain 40 to 60% by volume of alcohol for cooling mild astringency and refreshing. Emolliency is imparted readily by use of humectants (up to 3% of polyols). The antiseptics are usually employed

at concentration below 0.1% of active ingredients such as quaternary compounds and phenols. After-shave creams and emulsified lotions are also utilized by men, who find an alcoholic after-shave lotion dis-comfortable i.e., irritation in wind, sun and inclement weather. These emulsified lotions are simply emollient vanishing cream or hard lotions to furnish off the shave. “Witch hazelifiam” or “Snow” is examples of after-shave emulsified lotions.

Shampoo

Shampoo can be defined as a preparation of a surfactant in suitable form liquid, solid or powder. Which when used under the condition specified will remove surface grease, dirt and skin debris from hair shaft and scalp without affecting adversely the hair, scalp or health of the user. Shampoo leave the hair fragrant soft, lustrous and manageable. The formulation of a shampoo should have special capabilities like minimizing eye sting, controlling dandruff or imparting appealing fragrance to gain more favorable acceptance from particular segments of the population. There are variety of forms and types of shampoos are available in the market due to its unusual compensate and their combination such as;

- (i) Children’s and infants shampoo.
- (ii) Shampoo for dry, oily and normal hairs.
- (iii) Shampoo for men etc.

The most common form of the shampoo is cream and gel shampoos because of its high stability during storage and good efficiency. There are varieties of forms are available in the market like liquid, cream, gel, powder and aerosol etc. The major component of the shampoo is surfactant (soaps and synthetic detergent) with other additions like conditioners, sequestering agents, rinsing components (acids), foam builders, opacifying agents, clarifying agents (e.g. EDTA) anti-dandruff agent, thickening agent, preservatives, stability additives and other cosmetic additions (e.g. perfume and dyes). The special variety of shampoo is also available.

- (a) **Acid Balanced Shampoo** : As the term “acid balanced shampoo” called the balance of acidic nature of fatty acids of oils used in shampoo to maintain the “acid mantle of skin”. This is achieved by optimum concentration of alkaline compounds in shampoo.
- (b) **Egg Shampoo** : The Egg Shampoo is a type of special shampoo where shampoo is used as base and egg is for its special material to contact with the hair. Egg shampoo is used for its conditioning, nourishing as well as cheer effect to the hairs.

Talcum Powders

Talcum powders are the protective preparations against mechanical stress, which act as skin lubricants and cooling agent. Minute particles of powder have large surface area results in strong light dispersion, which visually covers the skin underneath. The surface of powdered skin exposed to air is much larger than that of un-powdered skin, so it leads to cooling effect. The fine particles and its lightweight, powder adheres to the skin by stickiness of the fat film and relief the skin from gravity and rubbing to remove it. The talcum powder consists of talc as main ingredients with additives like absorbent, adherent, covering agent, perfumes, heat conductive agents, fragrance and antioxidants etc.

Face Powder

A face powder is basically a cosmetic product, which has as its prime functions the ability to complement skin color by imparting velvet like finish. It enhances the appearance of the skin by masking the shine due to the secretion of sebaceous and sweats glands. Powder achieve its effect by being opaque enough to mask minor blemishes, but not import a mask like effect, It posses reasonably lasting properties. So that re-powdering frequently is unnecessary. It consists of various constituents, which imparts essential characteristics of a good product: -

1. *Covering Powder* : The ability to mask skin defects such as skin shine, enlarge pores and minor blemishes, e.g., zinc oxide, titanium dioxide etc.
2. *Slip* : The degree of spreading over the skin without dragging, and giving the characteristic smooth feeling, e.g., talc, aluminum hydrosillicate, zinc and magnesium soaps of higher fatty acids etc.
3. *Adhesiveness* : The ability to cleaning to the face e.g., zinc and magnesium stearates etc.
4. *Absorbency* : The capacity of absorbing skin secretions (perspiration and oiliness) without showing evidence of such absorption, e.g., colloidal kaolin, magnesium and calcium carbonate etc.
5. *Bloom* : The ability to impart a velvety, peach like finish to the skin, e.g., starches, guanine and bismuth chloride.

Compact Powder

Compact powder is a type of face powder compressed in to a cake and applied with a powder puff. It is more popular because of its ease in application, storage and convenience. Its formulation is same as face powder except it contains more concentration of binders. It has larger particle size than normal face powder and more adherences to the skin. It contains basic face powder

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ingredients like covering power agents, slipping agents, bloom and peach finish agent, absorbent, adherent, coloring agent and binding agent with preservatives.

There are varieties of binding agents like dry binder, oil binder, water-soluble or water repellent and emulsion binders are mostly used in compact. Because of the presence of binder, which are mostly susceptible to microbial attack, so most useful preservatives like p-hydroxy benzoate is used in formulation. Compacts are manufactured by various methods, such as wet method, dry method and damp method. Most commercially useful method is damp method.

Tooth Powder

Tooth powder is a preparation used for cleaning as well as therapeutic dentifrices. Most commonly its formulation consist of calcium carbonate as polishing agent, sodium soap like sodium lauryl sulfate as surface-active agent, mixture of insoluble sodium metaphosphate and tricalcium phosphate as an abrasive. Variety of the tooth powders available in the market according to their active constituents like ammoniated tooth powders, chlorophyll tooth powders, penicillin tooth powder and fluoride tooth powder etc. Tooth powder manufacturing consists of a homogeneous mixing of all ingredients without contamination of foreign solutions either added.

Tooth Paste

Toothpastes are the preparation intended for use with a toothbrush for the purpose of cleaning the accessible surface of the teeth. It enhance personal appearance by maintaining cleaner teeth, brushing with it reduce the tooth decay, helps to maintain healthy gingival and reduces the intensity of mouth odors. There are varieties of toothpaste are available in the market according to their components proposed for use in. Therapeutic purpose like chlorophyll toothpaste to prevent gingival disease and carries; anti-enzyme tooth paste for preventing dental carries; fluoride tooth paste for giving hardness and lasting quality to tooth structure and as anti-dental carries and cleaning purpose like ammoniated toothpaste loose the dental plaque by chemical reaction and make them susceptible to removal by tooth brushing.

The general formulation of toothpaste contains various ingredients for their special properties are as follows: -

1. *Abrasives* : It removes debris; residual stains from teeth and polishing agent. The agents uses for this purpose are calcium carbonate, dibasic calcium phosphate dehydrate, tricalcium phosphate, insoluble sodium metaphosphate, hydrated alumnae and calcium pyrophosphate etc.

2. *Surface-active agents* : These agents lower surface tension to improving cleaning and also for foaming characteristics, e.g., sodium lauryl sulphate, sodium coconut monoglyceride sulfanate and sodium N-lauryl sarcosinate etc.
3. *Humectants* : It is used to retain moisture or prevent paste from hardening of paste when it expose to air, e.g., glycerol, sorbitol and propylene glycol etc.
4. *Binders* : These are used to prevent separation of liquid phase from solid, particularly during storage, e.g., glycerite of starch, natural tree exudates, seaweed colloids, like Iris moss alginates and veegum etc.
5. *Flavors* : These are used to impart taste of paste. Most command flavors used in pastes are spearmint, peppermint, wintergreen and cinnamon-mint etc.
6. *Miscellaneous* : Therapeutics Ingredients like chlorophyll, fluorides, anti-enzymes agent and antibiotic etc.

Denture Cleaners

Dentures are similar to material teeth, which may develop plaques, deposits of tartar and brown spots due to smoking. So its cleaning is necessary to prevent an inflammation of gingival underneath. Denture cleaners are always available in the market are dry powders or tablets. They remain dry till they are used otherwise it become unattractive and loss their effectiveness. These are quickly dissolved in water to give clear solution. These preparations often contain common salt which act as filler and promotes the precipitation and removal of proteins in impurities. Alkaline salts such as trisodium phosphate and sodium carbonate etc., supports the action of surface-active agents. Denture cleaners usually consist of following substances or groups of sustainers.

1. Chemical active substances that degrade plaque and tartar, e.g., sodium hypochloride, sodium perborate and urea peroxide.
2. Surfactant facilitating the wetting of the denture and impurities on it.
3. Disinfectant.
4. Flavors, which mainly used in paste formulation.
5. Dyes to enhance esthetic appeal.
6. The use of denture cleaners are very simple just by placing denture over night or for 30 minutes in denture cleaning solution and then wash off with water.

Hair Conditioners

Hair conditioners are the preparations, which maintain the condition of hairs. Almost every hair preparations are claimed to hair conditioners. The products which involve with the mechanical and surface properties of hair like lubricity, manageability, substantively and sheen are enter in to hair conditioning can be achieved by various ways.

1. The products maintain the conditioning by improving ordering of cuticle scales resulting smooth hair surface, such type of products are simple acidic rinses.
2. The products, which adsorb chemical compounds in to the cuticle of hair resulting sheen, gloss and lubricity, such type of compounds, are Lewis acids and SAA.
3. The products containing proteins, such as collagen derived pepticles, (i.e., casein, albumin) which act optimum at pH 6.0 and absorb in to the damaged hair shaft to maintain conditions of hair.
4. The product-containing surface achieves agent, which act as ceroplastic and substantive to hair. It absorb by damaged hair to maintain its electrostatic nature, e.g. tetra alkyl substituted amine salt.
5. The oils and waxes containing product lubricate the hair shaft and improve optical properties of hairs, e.g. Brilliantine, cholesterol, lanolin, silicone oil and panthenal etc.

Lipsticks

Lipstick is generally accepted essential and leading makeup device available in variety of luster and texture. It is composed essentially of a oil-wax base, stiff enough to form a stick with a staining dye dissolved or dispersed in the oil, and pigment suspended there in, suitable perfumed and flavored, molded and enclosed in a case. The lipstick provides a convenient means of freshening the make-up. Lipsticks impart attractive color, glossy and most appearance to lips, accentuating good points and distinguishing the defects. The properly applied lipstick totally changes the apparent facial appearance. It also prevents cracking and chafing of lips to lead bacterial infection. It also provides emollient action to the lips. The formulation of lipsticks consists of oil and wax mixture having desired melting point and viscosity. The range of melting point choose for this mixture is 55°C to 75°C and most commonly used is 62°C for hot climatic areas. It also contains bromo mixture to impart indelible stain and colors or pigments. The other ingredients, which are used in lipstick formulation, are preservatives, fragrance, surfactant and stabilizers, emulsifiers and antioxidants etc.

Eye Liners

It is the oldest and most extensively used cosmetics for enhancing the eyes. It is a preparation, which harmonized with shades of mascara. Originally it is liquid dispersion but now as the development proceeds, it is successfully replaced by emulsified product, i.e. cream or cake. This preparation is formulated in such a way that can applied in a thin line cannot cake and water-resistant. Now a day, shiny and matte **eyeliners** are available in the market. These various types of eyeliners are available, i.e. lustrous, liquid eyeliner, cake or frosted cake eyeliner etc. The formulation of eyeliner consists of pigments or dyes, waxes, oils, gums, esters, preservatives, pearle scent and perfumes etc. High shine eyeliner is made by using material as latex (cosmetically safe) or carboset with addition of plasticizer such as glycerol, polyvinyl alcohol and polyvinyl acetate etc. The coloring agent which are most commonly used are carbon black, iron and chromium oxide pigments, carmine NF, and cochineal etc., which are FDA certified pigments. To achieve lighter and pastel shades titanium dioxide or zinc oxide is employed with pigments.

Liquid Soaps

Liquid soaps are generally defined as aqueous solutions of the salts of fatty acids. Originally they are obtained by saponifying the natural animal and vegetable fats and oils with alkali, as sodium and potassium hydroxide. But now alkyl amines are used as alkali, e.g., triethanolamine is most commonly used. It forms stable foam and less strong alkali reaction than sodium and potassium alkali. Production of good liquid soap by total saponification of neutral fats is an art, which require much experience. The soaps prepared from fatty acids with fewer than 10 carbons (coconut oil, palm oil and castor oil etc.) in the chain gives too soluble soap to form acceptable suds or to show acceptable detergency. Where as the soaps of fatty acids with more than 20 carbons are too insoluble to function effectively at normal temperature. Commonly used soaps have pH range from 7 – 10.

The soap solution having pH 10 - cause solubilization of skin lipids and cause dryness but the nearly neutral pH having soap solutions does not cause any harmful effect. Now a days, super fatted soap solutions are used which have lower pH in aqueous solution with emollient effect on skin. Most commonly used cleaning agent in liquid soap is sodium coconut fatty acids isethionate for dry and scaly skin. Others cleaning agents used, as detergent emulsion are sodium alkylphenoxy polyether sulfonate and alkyl ethanol imidazolinium sodium carbonate with other additives such cholesterol, petrolatum and perfumes. The advantages of these agents provide good cleaning with stable foaming properties. Some examples of marketed liquid soaps are Dettol Soap, Lifebuoy's liquid soap etc.

Baby Powders

The skin of babies is differing from adult both in histological and physiologically. It is thinner, less cornified and less hairy. It contains higher proportion of water and extra-cellular fluid material lacking in classic reticulum in structure. The baby powders are used principally as lubricant in skin folds to prevent chafing, to absorb perspiration, as water repellent to relieve prickly heat, to impart cleanliness and for pleasant fragrance to baby's skin.

The baby powder composition is similar to ordinary powder composition is similar to ordinary powder except it contain antiseptics, not highly perfumed flat, rounded and platelets shape. The best size of particle is 325 or 44 um range. Talc and natural hydrous magnesium silicate is the most important constituent of baby powders because it has excellent slip characteristics and good adhesion to the skin. Commonly raw-materials used for baby powder formulations are lithium stearate as adherent, olive oil to improve adherence and emollience, zinc oxide as opacifier to burning rays of the sun, astringent, neutralizing power soothing effect, colloidal kaolin to control power bulk property, unduecyclinates as antifungal and anti-bacterial agent, mild perfumes and boric acid as antiseptic etc. .

Packing of Cosmetics

The container should be selected carefully for cosmetic packaging to ensure that there is no interaction between cosmetic ingredient and packaging material. It must be ascertain that neither odour development due to glues nor any incompatibility between material of container and product being employed. The packaging operation plays an important role in stated parameters on the container. The packaging materials, which are commonly used, are plastic (PVC and PE) bottles and tubes for toiletries. Shampoos rinsed and liquid cosmetics are packed in containers having good barrier properties for water vapor, essential oils and air through container pores. Paste and solid cosmetics are package in metal like tin, aluminum, lead and most preferably plastic containers. Metal containers if used then they are coated internally by polyethylene or wax lining or dentifrices to protect corrosion. Dentifrice contains collapsible tubes, which is laminated structure comprising aluminum foil, layers of paper and polyethylene with plastic nozzle. Aluminum tube should not be used for fluoride containing paste. Fluoride containing paste is package in lead tube, which is internally coated with wax. Powders are mostly pack in tin plated or chemically treated steel or internally coated with suitable lacquer.