

# A Comprehensive Review on The Classification, Preparation Methods, Evaluation And Applications of Cream

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**Abstract-** Origin, way of life, age, and health are all reflected in the skin. Cosmetics are described as beauty products that, due to their components, have desired physiological actions, such as the ability to heal, smooth, and enhance the appearance of the skin. Creams are regarded as a crucial component of cosmetics. The majority of emulsions, are either solid or liquid condition are cream. When the ingredients, are heated to a liquid state and they placed into the packaging, they are emulsified in a molten state, if they set solid. In addition to protecting the skin against bacterial and fungal infections. Pharmaceutical creams are used for a range of aesthetic purposes, such as beautifying, hydrating, and lightening a number of disorders and diseases. Several physiochemical criteria, such as appearance, pH, emulsion type, extensibility, texture, spreadability, etc., were assessed for formulations. Creams come with a lot of benefits such as being easier to use and more effective than other products without causing any hazards. Application through skin or mucous membrane which produces localized, and systemic, effect at the site of application.

**Keywords-** Cream, Skin care, Semisolid dosage form, Cold cream, Vanishing cream, Night cream.

## I. INTRODUCTION

The word cosmetics comes from the Greek term Kosmesticos, which means to embellish. Following that period, all substances used to enhance or promote beauty came to be referred to as make up<sup>1</sup>. The origin of the word cosmetics can be traced back to its usage in ancient Rome. Article intended to be applied to human body by being rubbed, poured, or sprayed for cleansing, attractiveness, beautifying or altering the appearance is widely accepted the definition of cosmetic items. These were usually made by female slaves called cosmetae, from which the name “cosmetics” originated. Cosmetics were applied to improve the attractiveness. Since ancient times, cosmetics has been used<sup>2</sup>.

These days cosmetic plays a big role in men and women. The importance of cosmetics has been increased as a result of the desire for youth and attractiveness. Cosmetics are widely accessible in the variety of forms such as cream, hair sprays, eye shadow, lipstick, nail polish and scents<sup>3</sup>. Skin looks more radiant after using the base cream because of additional cosmetics like face powder. Then there are lipsticks, which many women of all ages apply<sup>4</sup>.

Wax and the appropriate quantity of cocoa butter are used to make them. Cosmetic that both men and women use on a regular basis, such as lotions, gels and colognes. In several situations, creams can be used to cleanse the face to remove the dirty on the skin. Cosmetics has been used by many celebrities and artists to combat the harsh lighting and camera flash glare. They use a range of cosmetics to preserve their appearance because they understand how appearance is important. Cosmetics helps to shield the skin from the sun's rays according to recent studies<sup>3</sup>.

Today, cosmetics are important because they improve our appearance and boost self-esteem. We can see that cosmetics are highly important in our daily lives because they are more of them on the market now than ever before.<sup>3</sup>

## II. TOPICAL MEDICATION ADMINISTRATION

The delivery of pharmaceutical to the body by oral, sublingual, rectal, parenteral, inhalation, and other methods has been utilized in the recent decades to cure ailments. In order to limit the pharmacological or impact of a drug to the skin's surface or within it. Topical drug delivery refers to the direct application of a drug formulation to the skin to treat a cutaneous disease. Medicated drugs such as lotions, foams, gels, ointments, and other topical administration methods are also utilized, but semisolid formulations in all varieties predominance in the topical drug delivery system.<sup>5,6</sup>

### III. ANATOMY OF SKIN

The skin is the essential part of the integumentary system such as hair, nails, and sweat glands. Skin is the largest organ in the human body which contains 15% of the total body weight. The skin is made up of three layer, they are

1. Epidermis
2. Dermis
3. Hypodermis

#### Epidermis

Epidermis is the outer most layer in the skin. The epidermis has no blood vessels and it is nourished by the diffusion from dermis. Epidermis is mainly made up of cells that, are keratinocytes, melanocytes, langerhans cells, merkel cells, and inflammatory cells. It helps to regulate the temperature in the human body. It is divided into the five sublayers such as<sup>10</sup>

- Stratum corneum
- Stratum lucidum
- Stratum granulosum
- Stratum germinativum
- Stratum spinosum

#### Dermis

The dermis is the middle layer in the skin. It contains the primary cells including mast cells, macrophages, and fibroblasts. It contains the epithelial cells and cushions. Fibroblast gives elasticity, and strength. It consists the blood vessels, oil, sweat glands, and hair follicles<sup>9</sup>.

#### Hypodermis

The hypodermis is the inner most layer in the skin. Many types of cells present in the layer that are adipose tissue, blood vessels, and macrophages. These are made up of secretory epithelial cells that is comes from the same tissue as hair follicles. They are found in all body parts with the expectation of the palm in the hands and the soles in the feet, and they exude an oily material called sebum into the hair follicles. The skin of the face, groin, axillae, and scalp has the highest concentration of them<sup>9,10</sup>.

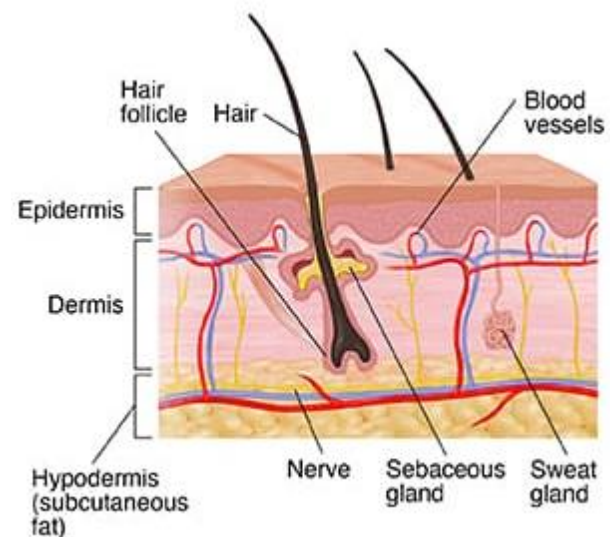


Figure 1 : Structure of Skin

### IV. FUNCTIONS OF SKIN<sup>22</sup>

#### 1. Protection :

A natural defense mechanism, protection is provided by the Langerhans cells in the skin, which are a component of the adaptive immune system. They serve as an adaptive immune system. They serve as an anatomical barrier against infections and Damage between the interior and exterior environment.

#### 2. Sensation :

It is referred to as somatosensory system and haptics, it is composed of a multitude of nerve endings that respond to temperature, pressure, touch, vibration, and tissue damage.

#### 3. Control of heat :

The skin's substantially larger blood supply than needs for accurate management of energy loss by conduction, convection, and radiation. Constricted arteries greatly decrease the subcutaneous blood flow and retain heat, but it dilate blood vessels which promote penetration and evaporation of heat.

#### 4. Fluid control :

The skin acts as a semi-impermeable, slightly dehydrates the barrier against fluid loss. Burn victims lose a significant amount of fluids as a result of the loss of this functions.

### 5.Communication and aesthetics :

People can understand our skin tone, emotional condition, and physical appearance.

### 6.Storage and synthesis :

Provides a place to store water and fats, and when UV light strikes specific areas of the skin, it initiates the synthesis of vitamin D.

### 7.Resistance of water :

To prevent the essential nutrients from being washed out of the body, the skin functions as a water-resistance barrier.

## V. DISEASE AFFECTED ON THE SKIN<sup>3</sup>

- Eczema
- Melanoma
- Acne vulgaris
- Scabies
- Psoriasis
- Moles
- Hives
- Shingles
- Rosacea

## VI. CREAMS

Creams are the topical drug delivery system which is applied above the skin which produces the localized effect. Creams are defined as the semi-solid dosage form which is the mixture of two phases (oil and water) by the continuous stirring until which forms a creams. Creams are applied cosmetically, such as cleansing, beautifying, improve the appearance and for therapeutic action on the skin. In order to improve specific-site drug delivery system for the skin disorders, there products are intended to be used topically<sup>7</sup>.

Creams are made using methods created in the pharmaceutical business, such as medicated and non-medicated cream used to treat a variety of diseases, creams are regarded as a pharmaceutical items. Based on the needs of each person's skin condition, formulations of creams such as the ayurvedic, herbal, and allopathic<sup>8,9</sup>.

### ADVANTAGES<sup>3,10,11</sup>

- It is used externally.
- It is less greasy when compared to ointment.
- Easy to apply on the skin.
- It avoid the first pass metabolism due to directly reach the synthetic circulation.
- It is suitable dosage form for bitter drugs.
- It has less side effects.
- It is easily washable.
- It is convenient for unconscious patients having difficulty in oral administration.
- Avoid gastro-intestinal irritation.
- Increase the bioavailability.

### DISADVANTAGES<sup>3, 10, 11</sup>

- It has low penetration through the skin.
- It has less hydrophobic than the other solid preparation, so risk of contamination is higher than others.
- Allergic reaction is possible.
- Stability is not good when compare to ointment.
- It is more bulky to handle when compare to solid dosage form.
- It causes the skin irritation due to the addition of excipients on the formulation.
- It has low plasma concentration.
- Drugs have the higher molecular weight so, absorption through the skin is difficult.

### BASES USED IN THE CREAM

- Oleaginous base
- Absorption base
- Emulsion type base
- Water soluble base.

### TYPES OF CREAM

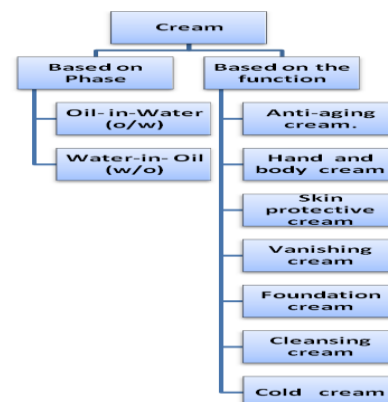


Figure 2 : Types of Cream

**A. Based on phase****1. Oil-in-Water (o/w)**

- It is the consists of the small droplets of oil phase is distributed into the water phase.
- Dispersed phase- oil
- Continuous phase- water.
- Ex: Vanishing cream.

**2. Water-in- Oil (w/o)**

- It is the consists of the small droplets of water phase is distributed into the oil phase
- Dispersed phase- water
- Continuous phase- oil.
- Ex: Cold cream.<sup>11-13</sup>

**B. Based on the function<sup>23,24</sup>**

- Cleansing cream
- Foundation cream
- Massage cream
- Vanishing cream
- Cold cream
- Night cream
- Skin protective cream
- Hand and body cream
- Anti-aging cream.<sup>14-16</sup>

**1.Cold Cream**

Cold cream is also called as the moisturizing cream. This types of cream is comes under the water-in-oil type of emulsions. After application of cream on the skin which produces the cooling sensation by the evaporation of water.

**Procedure of cold cream :**

- Melt the white bees wax with liquid paraffin at 70°C.
- Dissolve the borax in water under the water bath at 70°C.
- Add the aqueous phase into the oil phase and maintain the temperature , then stirred continuously until forms a cream.

**Table 1 : Formulation of Cold cream**

S.N O	INGREDIEN TS	WORKING FORMULA(100 g)	STANDARD FORMULA(20 g)
1.	White bees wax	16 g	3.2 g
2.	Liquid paraffin	50 ml	10 ml
3.	Borax	0.8 g	0.16 g
4.	Water	33.2 ml	6.6 ml

**Figure 3 : Cold Cream****2.Vanishing Cream**

The vanishing cream are seem to fade away when it is applied on the skin, these creams are sometimes known as disappearing creams. The foundation of these composition is stearic acid. The cream has a drying impact on the skin and leaves behind a sticky, dry residue after use. They are especially used in hot climates when skin lost the moisture.

**Figure 4 : Vanishing Cream****3.Foundation Cream**

Cream that act a foundation. These cream are used to apply makeup. When applying makeup powders, it serves as an adhesive base. To keep the skin from getting over oily or dry, they offer an emollient effect and environmental protection. Using multiple colours to the face allows makeup to mask imperfections, alter skin

tones, and create a consistent, even tone that resembles the complexion.



**Figure 5 : Foundation Cream**

#### 4. Massage Cream

Massage creams are emollients that are applied to the skin and works as a massage oil.



**Figure 6 : Massage Cream**

#### 5. Night Cream

These creams are commonly used to cure dry skin or to nourish the skin. Night creams are primarily defined as cream that are applied to skin and left for a few hours during the course of night.<sup>14-17</sup>



**Figure 7 : Night Cream**

### EXCIPIENTS USED IN CREAMS

#### 1. Water

Water is used to dissolved the ingredients, which is acts as the universal solvent. It is the easily available and very cheapest raw material. It is free from the dust, and other microorganism to avoid the contamination or the any other chemical reaction on the preparation of creams<sup>18</sup>.

#### 2. Oils,fats and waxes

The oil, fat, waxes are derived from the plant or animal sources such as the sunflower oil, olive oil, almond oil, sesame oil, peanut oil, oilseed rape, palm oil, beef tallow. Waxes are acts as emulsifier, fats are acts as thickening agent, and oils are acts as perfuming and preservatives based on the activity<sup>19</sup>.

#### 3. Mineral Oils

It is naturally obtained from crude petroleum oil. It helps to prevent water loss from the body. It weight is very less and inexpensive. It has some characteristic such as colourless, odourless and tasteless. It is also called as base oils, mineral base oil or lubricant base oil.

#### 4. Colour

Colour is used to increase the appearance of the cream such as the turmeric, saffron, henna, catechu, and indigo<sup>20</sup>.

#### 5. Humectants

Humectants are hygroscopic in nature. They are used to reduce the moisture such as sodium PCA, sodium- L-Lactate, hydroxyethyl urea, glycerine, betaine<sup>17</sup>.

#### 6. Perfumes

Perfumes are used to enhance the smell or mask the unpleasant smell in thecreams. They are such as lavender, jasmine, geranium, ylang-ylang, rose water, and orange blossom<sup>20</sup>.

#### 7. Preservatives

The preservatives are used to avoid the microbial contamination during the preparation, storage and packaging. They are benzoic acid, formaldehyde, ethanol.

#### 8. Buffer

The buffer is used to maintain the  $p^H$  of the cream. They are citrate buffer, phosphate buffer.

## 9. Chelating agents

The Chemical substances that reacts with the metal ions to form Complex.

## METHOD OF PREPARATION

- Mechanical method
- Trituration method
- Levigation method
- Fusion method.

## EVALUATION OF CREAM

- Determination of  $p^H$
- Viscosity
- Saponification test
- Acid value test
- Homogeneity
- Dye test
- Physical appearance
- Spreadability
- Skin irritation test
- Rheology study
- Thermal behaviour
- Tensile strength
- Washability
- Solubility test<sup>20</sup>.

## APPLICATIONS OF CREAM

- Anti- aging
- Smoothing
- Moisturising
- Cleansing
- Anti-wrinkle
- Killing of germs
- Softening
- Reduce dark spots

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