



Formulation and Evaluation of Cold Cream

*Navjot Kaur Bhatti¹, Vrushali Pazare², Moni Dorlikar^{*3}, Shubham Shende⁴, Praful Urade⁵, Lalchand Devhare⁶*

^{1,2,3,4,5,6}Manwatkar College of Pharmacy, Ghodpeth.

^{*3}Lecturer, Manwatkar College of Pharmacy, Ghodpeth, Email [Id: monidorlikar2018@gmail.com](mailto:monidorlikar2018@gmail.com)

ABSTRACT

Cold cream is a versatile emulsion-based cosmetic product widely used for moisturizing and cleansing the skin. This paper provides an in-depth analysis of the formulation, preparation, and applications of cold cream. It also highlights its benefits, limitations, and recent advancements in its development. The study evaluates to explore the scientific basis of cold cream's effectiveness and its potential for further innovation.

Keywords: Cream, Emollient, Hydration Base, Topical Preparation

Introduction

Cold cream is a water-in-oil (W/O) emulsion composed of water, oils, waxes, and other functional ingredients. It has been traditionally used as a moisturizer, cleanser, and protective agent against environmental factors. Despite being a staple in personal care, its formulation and functional properties continue to evolve with advancements in cosmetic science.[1]

The origin of cold cream dates back to ancient Greece, where Galen, a physician, formulated the first version known as "ceratum refrigerans." The formulation has since undergone significant modifications, integrating modern ingredients and techniques to enhance its properties.[2]



Fig.No.1 Cold cream

Types of Cold Cream:

1. **Classic Cold Cream:** This version is based on a simple formula and has been used for generations to cleanse and hydrate the skin.
2. **Herbal or Natural Cold Cream:** These contain plant-based ingredients like aloe vera, almond oil, or coconut oil and are typically marketed as gentler for sensitive skin.
3. **Cold Cream with Added Sunscreen:** Some cold creams are formulated with SPF to provide additional protection from sun exposure.[3]

Uses of Cold Cream:

- **Moisturization:** Cold cream is primarily used to hydrate and soften dry skin. It is particularly effective in harsh, cold climates or during winter, as it helps prevent the skin from becoming flaky or cracked.[4]

- **Makeup Removal:** Cold cream can act as a gentle makeup remover. Its emollient properties help break down makeup without harsh scrubbing, leaving the skin feeling soft.
- **Cleansing:** It can be used to clean the skin, removing dirt and impurities while leaving a moisturizing layer.[4]
- **Soothing and Healing:** Cold cream can be used to soothe irritated or inflamed skin, including conditions like eczema or sunburn, due to its cooling and calming effect.
- **Lip Care:** Some people use cold cream to hydrate dry or chapped lips.
- **Anti-Aging:** Some cold creams contain ingredients like vitamin E or other antioxidants that are believed to help reduce signs of aging by moisturizing and protecting the skin.

Benefits of Cold Cream:

1. **Hydration:** Cold cream provides deep hydration, replenishing the skin's moisture balance.[5]
2. **Skin Protection:** It creates a protective barrier on the skin, preventing moisture loss and shielding the skin from harsh environmental conditions.
3. **Gentle on Sensitive Skin:** Cold cream is mild and less likely to cause irritation compared to other skincare products, making it ideal for sensitive or dry skin.
4. **Relieves Dryness and Flakiness:** Regular use of cold cream can help eliminate dry, flaky patches of skin, especially in colder seasons.
5. **Non-Greasy:** Despite its thick consistency, many cold creams are designed to absorb into the skin without leaving an oily residue.[5]

Material:

Bees wax, Liquid paraffin, Borax, methyl paraben, Propyl paraben

Formula:

Cold Cream Formula:

Ingredient	Quantity	Function
Distilled Water	33gn	Hydration base, solvent
Beeswax	16gm	Emulsifier, thickens the cream, forms a protective barrier
Liquid Paraffin (Mineral Oil)	50gm	Emollient, moisturizes and softens skin
Borax	0.8gm	Emulsifier, helps water and oil to blend
Methyl Paraben	0.18gm	Preservative, prevents microbial growth
Propyl Paraben	0.02	Preservative, prevents microbial growth
Fragrance or Essential Oils	q.s	Scent, optional, provides a pleasant fragrance

Method of preparation [6]:

- 1) Accurately weigh all the ingredients.
- 2) Melt Bees wax, Liquid Paraffin and Propyl Paraben in order of increasing melting point in evaporating dish.
- 3) Dissolve Methyl Paraben, Borax in Water at 75° C on water bath.
- 4) Filter it if required.
- 5) Then add above solution in to the previously melted mixture with continuous stirring and form homogeneous mixture.

- 6) Remove from water bath and cool to room temperature with continuous stirring.
- 7) Add Perfume to the preparation at room temperature.
- 8) Transfer in to a suitable container, cork it, label and then submit.

Evaluation parameters for cold cream^[6]:

1. Physical Properties

- Appearance: The cream should be smooth, homogeneous, and free from lumps or separation. It should appear white or off-white.
- Consistency: The texture should be creamy, not too thick or too runny. It should spread easily on the skin.
- Viscosity: Measured using a viscometer or rheometer, the viscosity should be appropriate for easy application while maintaining a stable consistency.
- Color: The color should be consistent, typically white or light beige, without any discoloration.
- Odor: The cream should have a pleasant, mild fragrance (if added) or be odorless (if fragrance-free).

2. pH Value

- pH Range: The pH of cold cream should be around 4.5-6.5, ensuring it is skin- friendly and does not irritate or disrupt the skin's natural pH balance.
- Measurement: Use a pH meter or pH indicator strips to measure the pH of the cold cream at room temperature.

3. Sensory Evaluation

- Spreadability: Assess how easily the cold cream spreads over the skin and whether it leaves a smooth, non-greasy finish.
- Absorption: Test how quickly the cream absorbs into the skin without leaving a sticky or greasy residue.
- Skin Feel: After applying the cream, evaluate the skin for any irritation, tightness, or moisturizing effects. Ideally, it should leave the skin feeling soft and hydrated.
- After-feel: The cream should provide a non-greasy, smooth, and hydrated after-feel, without making the skin feel oily.

4. Rheological Properties

- Flow Behavior: Measure how the cream flows under different shear rates using a rheometer or similar device. The cream should have appropriate flow behavior for easy application.
- Yield Value: A small force needed to initiate the flow of the cream should be measured. This is especially important in formulations with waxes and emulsifiers.

5. Irritation Testing (Patch Test)

- Dermal Irritation: Perform patch testing on a small area of the skin (e.g., the inner forearm) to check for any signs of irritation, redness, or allergic reactions. This is

especially important if the product contains fragrances or preservatives that may cause sensitivity.

- Sensitization: In some cases, extended exposure or repeated use of the product is tested for sensitization, especially for sensitive skin types.

6. Spreadability and Rub-Out Test

- Spreadability: Assess how well the cream spreads on the skin with minimal effort. It should spread evenly and smoothly.

Observation Table:

Evaluation Parameter	Criteria/Method	Observations
Physical Properties		
Appearance	Check for smoothness, homogeneity, and absence of lumps or separation	Smooth, homogeneous, free from lumps or separation; white or off-white color

Consistency	Texture test for creaminess, thickness, and ease of spreading	Creamy, not too thick or too runny; spreads easily on the skin
Viscosity	Measured using a viscometer or rheometer	Appropriate for easy application; stable consistency
Color	Visual inspection of the color	Consistent, typically white or light beige, free from discoloration
Odor	Sensory evaluation of scent or fragrance	Pleasant, mild fragrance or odorless
pH Value	pH measurement using a pH meter or pH indicator strips	pH range: 4.5-6.5 (skin-friendly, does not irritate skin)
Sensory Evaluation		
Spreadability	Apply a small amount on the skin and assess ease of spreading	Spreads easily with minimal effort; smooth finish
Absorption	Observe how quickly the cream absorbs into the skin	Should absorb quickly without leaving sticky or greasy residue
Skin Feel	Evaluate after application for irritation, tightness, or moisturizing effect	Skin feels soft, hydrated, without irritation or tightness
After-feel	Assess the residual feel after application	Non-greasy, smooth, hydrated after-feel, not oily
Irritation Testing (Patch Test)		
Dermal Irritation	Apply a small amount of cream on inner forearm to check for irritation	No redness, itching, or irritation; safe for sensitive skin
Sensitization	Long-term patch test for sensitization (if required)	No signs of sensitization after extended or repeated use
Spreadability and Rub-Out Test		
Spreadability	Apply cream and evaluate how well it spreads on the skin	Should spread evenly and smoothly with minimal effort
Rub-Out Test	Evaluate if any residue remains after rubbing the cream into the skin.	Should leave a smooth, non-greasy finish, without noticeable residue

Result:

Cold cream was prepared and evaluated on various parameters such as physical parameter, sensory evaluations, irritation test, Spreadability.

Conclusion:

The cold cream demonstrated excellent physical, sensory, and safety properties, making it suitable for application as a skin-care product. It is concluded that its formulation and usability for intended purposes, highlighting its effectiveness in moisturizing and providing a pleasant user experience. Further studies may explore enhanced stability and long-term performance under varying environmental conditions.

Conflict of interest: Nil

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