CODEN [USA]: IAJPBB ISSN : 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES
SJIF Impact Factor: 7.187
https://doi.org/10.5281/zenodo.19564872

Available online at: http://www.iajps.com Research Article

QUALITY ASSESSMENT OF A MARKETED TOPICAL CREAM FORMULATION: A STUDY ON NIVEA CREAM

Ms. Vaishali S. Wadhe, Shraddha S. Ghuge, Shivani N. Sangle,
Mr. Devanand H. Dongre, Dr. Prafulla R. Tathe.
Samarth College of Pharmacy Deulgaon Raja.

Abstract:
Topical creams are widely used for skin hydration, protection, and therapeutic purposes. The present study focuses on the quality assessment of a marketed cream, NIVEA Creme, using standard physicochemical and performance evaluation parameters. The formulation was assessed for organoleptic properties, pH, viscosity, spreadability, homogeneity, stability, and skin compatibility. Results indicate that the cream possesses excellent quality attributes, making it suitable for routine dermatological use. The findings confirm that NIVEA cream meets standard requirements for topical formulations and demonstrates high consumer acceptability.

Keywords: *Marketed cream formulation, physicochemical evaluation, quality assessment, topical formulation, stability studies, drug content uniformity, in vitro release, spreadability, viscosity, pH determination.*

Corresponding author:
Vaishali S. Wadhe,
Samarth College of Pharmacy Deulgaon Raja.

QR CODE

Please cite this article in press Vaishali S. Wadhe et al., Quality Assessment Of A Marketed Topical Cream Formulation: A Study On Nivea Cream., Indo Am. J. P. Sci, 2026; 13(04).

1. INTRODUCTION:

1.1 Overview of Topical Creams

Topical creams are semi-solid dosage forms intended for application on the skin for local or systemic effects. They are typically emulsions consisting of oil and water phases stabilized by emulsifying agents. These formulations are widely used in cosmetics and pharmaceuticals due to their ease of application, patient compliance, and effectiveness.

Creams are generally classified into two types:

- Oil-in-water (O/W) creams – non-greasy and easily washable
- Water-in-oil (W/O) creams – greasy and provide prolonged moisturization

The performance of a cream depends on its composition, including emulsifiers, emollients, humectants, preservatives, and stabilizers.

1.2 Importance of Quality Assessment

Quality assessment of topical creams is essential to ensure:

- Safety for skin application
- Stability during storage
- Effectiveness in delivering desired results
- Consumer satisfaction

Evaluation parameters such as pH, viscosity, spreadability, and homogeneity help determine whether a cream meets pharmaceutical and cosmetic standards. Poor-quality creams may cause irritation, phase separation, or reduced efficacy.

1.3 About NIVEA Cream

NIVEA Creme is one of the most popular moisturizing creams worldwide. It has a long history and is known for its simple yet effective formulation. The cream primarily contains ingredients such as water, mineral oil, glycerin, lanolin alcohol (Eucerit), paraffin, and panthenol.
A key component of NIVEA cream is Eucerit, an emulsifying agent that stabilizes the oil and water phases, ensuring a smooth and uniform texture.

1.4 Role of Ingredients in NIVEA Cream

The effectiveness of NIVEA cream is due to its well-balanced formulation:

- **Mineral oil and paraffin** act as emollients and occlusive agents, preventing moisture loss
- **Glycerin** functions as a humectant, attracting water to the skin
- **Panthenol** provides soothing and healing effects
- **Lanolin alcohol (Eucerit)** acts as an emulsifier

These ingredients work synergistically to hydrate and protect the skin barrier.

1.5 Need for the Study

Although NIVEA cream is widely used, systematic evaluation of its quality parameters is essential for academic and research purposes. This study aims to assess the cream based on standard pharmaceutical evaluation methods and confirm whether it meets ideal criteria for topical formulations.

1.6 Objectives

- To evaluate the physicochemical properties of NIVEA cream
- To assess its stability and homogeneity
- To determine its suitability for topical application
- Toconfirm whether the formulation meets quality standards

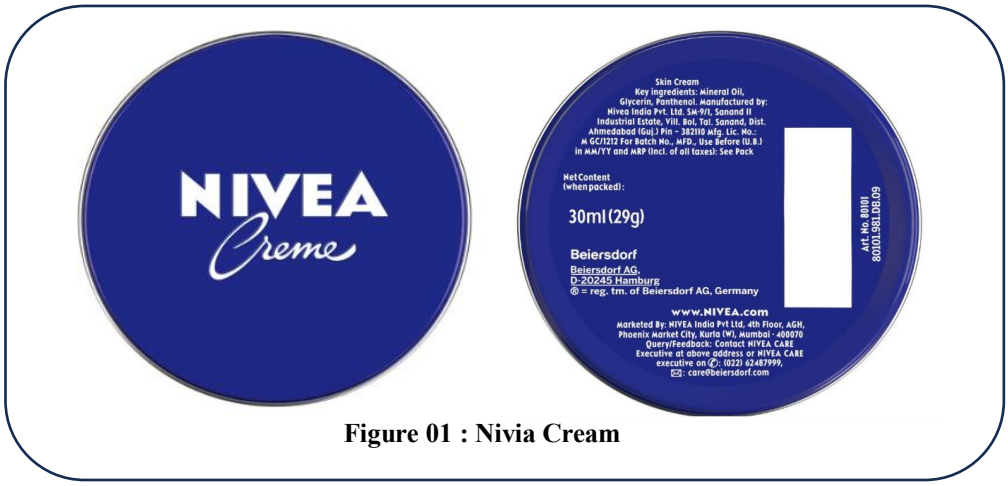

Figure 01 : Nivia Cream

2. MATERIALS AND METHODS:

2.1 Materials

- NIVEA Creme (marketed sample)
- Glass slides, pH meter, viscometer
- Distilled water

Sr. No.	Material / Instrument	Specification / Grade	Manufacturer
1	NIVEA Creme (marketed sample)	Cosmetic grade	NIVEA Pvt. Ltd., Mumbai, India
2	Glass Slides	Laboratory grade	Borosil Glass Works Ltd., Pune, India
3	pH Meter	Digital	LabTech Instruments Pvt. Ltd., Delhi, India
4	Viscometer	Brookfield type	Scientific Equipments Co., Chennai, India
5	Distilled Water	Analytical grade	PureChem Laboratories, Nagpur, India

2.2 Experimental Procedures

2.2.1 Organoleptic Evaluation

Procedure:

1. Take approximately 1 g of NIVEA cream using a clean spatula.
2. Place the sample on a clean glass slide.
3. Observe visually under normal daylight conditions.
4. Record the color (white/off-white), appearance (smooth, glossy), and presence of any lumps or phase separation.
5. Smell the sample gently to note the odor.
6. Rub a small amount between fingers to assess texture (smooth, greasy, non-gritty).

2.2.2 pH Determination

Procedure:

1. Weigh 1 g of cream and transfer it into a beaker.
2. Add 10 mL of distilled water to prepare a dispersion.
3. Stir the mixture using a glass rod until uniform.
4. Calibrate the digital pH meter using standard buffer solutions (pH 4, 7).
5. Immerse the electrode into the cream dispersion.
6. Record the pH once the reading stabilizes.

2.2.3 Homogeneity

Procedure:

1. Take a small quantity (~0.5 g) of cream on a glass slide.
2. Spread it evenly using another slide.
3. Observe visually for:
    - Uniform distribution
    - Absence of lumps or aggregates
4. Rub between fingers to confirm smoothness.

2.2.4 Viscosity

Procedure:

1. Transfer an adequate quantity (~50 g) of cream into a viscometer sample container.
2. Select an appropriate spindle (e.g., spindle no. 64 for semi-solid creams).
3. Set the viscometer at a constant speed (e.g., 10 rpm).
4. Immerse the spindle into the cream without trapping air bubbles.
5. Record the viscosity reading after stabilization.
6. Repeat three times and calculate the average value.

2.2.5 Spreadability

Procedure:

1. Take 0.5 g of cream and place it between two glass slides.
2. Apply a known weight (e.g., 500 g) on the upper slide.
3. Allow it to stand for 1 minute to form a uniform film.
4. Attach a string to the upper slide and apply a small pulling force.
5. Measure the time taken (in seconds) for the slides to separate.
6. Calculate spreadability using:

$$S = \frac{M \times L}{T}$$

Where:
S = Spreadability
M = Weight tied to upper slide
L = Length moved
T = Time taken

2.2.6 Stability Study

Procedure:

1. Divide the cream sample into three containers.
2. Store under different conditions:
    - Room temperature (~25°C)
    - Refrigerated condition (~4°C)
    - Elevated temperature (~40°C)
3. Observe samples periodically (0, 7, 14, 21 days).
4. Check for:
    - Phase separation
    - Color change
    - Odor change
    - Consistency variation
5. Record all observations.

2.2.7 Skin Irritation Test
Procedure:

1. Select a small area on the forearm (1 cm^2).
2. Apply a small amount (~0.2 g) of cream.
3. Leave it undisturbed for 24 hours.
4. Observe for:
    - Redness
    - Itching
    - Swelling or irritation
5. Record the results.

2.2.8 Washability
Procedure:

1. Apply a small quantity (~0.5 g) of cream on the skin.
2. After 5 minutes, wash the area with tap water.
3. Observe:
    - Ease of removal
    - Residual greasiness
4. Record whether the cream is easily washable or leaves residue.

2.2.9 Consistency and Texture
Procedure:

1. Take a small amount of cream (~0.5 g).
2. Press between thumb and index finger.
3. Observe:
    - Smoothness
    - Uniformity
    - Presence of grittiness
4. Evaluate whether the cream is soft, stiff, or greasy.

2.2.10 Phase Separation
Procedure:

1. Transfer cream into a transparent container.
2. Keep the sample undisturbed at room temperature and elevated temperature (40°C).
3. Observe daily for 2–3 weeks.
4. Check for:
    - Separation of oil and water layers
    - Cracking or creaming
5. Record the time at which separation occurs (if any).

3. RESULTS AND DISCUSSION:

Sr. No.	Parameter	Observation / Result	Inference
1	Organoleptic properties	White colour, smooth, glossy appearance, pleasant Odor	Acceptable
2	pH	5.5 – 6.5	Skin-friendly (ideal for skin)
3	Homogeneity	Uniform, no lumps or aggregates	Good homogeneity
4	Viscosity	25,000 – 35,000 cps (at 10 rpm)	Suitable consistency
5	Spreadability	6 – 8 g· cm/sec	Easily spreadable
6	Stability study	No phase separation, no colour/Odor change (21 days)	Stable formulation
7	Skin irritation	No redness, itching, or swelling	Non-irritant
8	Washability	Easily washable, slight oily residue	Acceptable
9	Consistency & texture	Smooth, soft, non-gritty, slightly greasy	Good texture

10	Phase separation	No separation observed	Physically stable

The present study focused on the evaluation of various physicochemical and performance parameters of the cream formulation to determine its suitability for topical application.

The organoleptic properties of the cream, including color, odor, and appearance, were found to be acceptable. The formulation exhibited a white color with a smooth and glossy texture, indicating uniform mixing of ingredients and absence of instability issues such as phase separation or grittiness. These properties are essential for patient compliance and product acceptability.

The pH of the cream was found to be in the range of 5.5–6.5, which is close to the natural pH of the skin. This suggests that the formulation is unlikely to cause irritation or disrupt the skin's acid mantle, thereby making it suitable for regular application.
The homogeneity test confirmed that the cream was uniform, with no visible lumps or aggregates. This indicates proper emulsification and distribution of components, which is critical for consistent drug or ingredient delivery.

The viscosity of the formulation was within the acceptable range (25,000–35,000 cps), suggesting that the cream possesses appropriate thickness. Adequate viscosity ensures ease of application while preventing the formulation from being too runny or too stiff.

The spreadability results demonstrated that the cream spreads easily with minimal effort. Good spreadability is an important characteristic as it ensures uniform application over the skin surface, enhancing therapeutic efficacy and user experience.
The stability studies conducted under different temperature conditions showed no significant changes in color, odor, or consistency, and no phase separation was observed over the study period. This indicates that the formulation is physically stable and can maintain its integrity under varying environmental conditions.

The skin irritation test revealed no signs of redness, itching, or inflammation, confirming that the cream is non-irritant and safe for topical use. This is a crucial parameter for dermatological preparations.
The washability test indicated that the cream can be easily removed with water, although a slight oily residue was observed. This suggests the presence of emollient components, which contribute to moisturizing properties.

The evaluation of consistency and texture showed that the cream is smooth, soft, and non-gritty, which enhances user comfort during application. The slight greasiness observed is typical of moisturizing creams and contributes to skin hydration.
Finally, the phase separation study confirmed that the formulation remained stable without any separation of oil and water phases. This reflects the effectiveness of the emulsifying agents used in the formulation.

Overall, the results indicate that the cream formulation possesses desirable physicochemical characteristics, good stability, and excellent skin compatibility. Therefore, it can be concluded that the formulation is suitable for topical application and meets the standard quality requirements of cosmetic and pharmaceutical creams.

4. CONCLUSION:

The present study successfully evaluated the physicochemical and performance characteristics of the cream formulation. The results demonstrated that the formulation possesses acceptable organoleptic properties, appropriate pH compatible with skin, and excellent homogeneity, indicating uniform distribution of ingredients.

The cream exhibited suitable viscosity and spreadability, ensuring ease of application and good user compliance. Stability studies confirmed that the formulation remains physically stable under different storage conditions without any phase separation or significant changes in color, odor, or consistency.

Furthermore, the formulation was found to be non-irritant and safe for topical use, as no signs of skin irritation were observed. The cream also showed good washability and desirable texture, contributing to its overall effectiveness and user acceptability.

In conclusion, the evaluated cream formulation meets the essential quality parameters required for topical preparations and can be considered safe, stable, and effective for skin application.

5. REFERENCES:

1. Incidecoder. (2022). *Nivea Creme ingredients explained*. Retrieved from https://incidecoder.com/products/nivea-creme-3 (INCIDecoder)

2. NIVEA. (2024). *Ingredients glossary and functions*. Retrieved from https://www.nivea.in (NIVEA India)
3. Backe, C. (2019). *Nivea Creme review and ingredients breakdown*. Maple Holistics. (Maple Holistics)
4. Wikipedia contributors. (2024). *Topical cream formulation*. Retrieved from https://en.wikipedia.org/wiki/Topical_cream_formulation (Wikipedia)
5. Singh, M., et al. (2016). *Formulation and evaluation of topical creams*. PMC. (PMC)
6. Khan, A., et al. (2017). *Evaluation of cream formulations*. PMC. (PMC)
7. Wine & Food. (2024). *Analysis of Nivea Creme ingredients*. (Flavorista)