



# Formulation And Evaluation of Herbal Face Serum.

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## ABSTRACT

Face serum are often used to manage specific skin concerns such as wrinkles, acne, dry skin and dullness. They are designed to brighten, hydrate and provide a variety of benefits, depending on the types of serum you use. Aloe vera gel is commonly used to treat different skin disease, sun burn, minor cuts, insect bites,, and used as wound healing, Anti-inflammatory, anti- bacterial, and Anti-fungal effect. Serum has a property of rapid absorption and ability to penetrate into deeper layer of the skin. Serum usually contains a higher concentration of Active ingredients compared to moisturizers. Facial wrinkles and skin aging are undesirable outcome of photo damage and ultraviolet (UV) rays. The face serum was evaluated for its Physiochemical parameters, pH, globule size, consistency.

## Keyword

Face serum, skin, etc

## INTRODUCTION

Cosmetics is a Greek word which means to \_adorn ‘ (addition of something decorative to a person or a thing) . Cosmetology is the study and application of beauty treatment. It’s an art or science of beautifying and improving the skin, nails and the study of cosmetics and their application.

Serum is the concentrated solution which is commonly used in cosmetology. In water or oil the cosmetic serum is just as potent as any other cream therefore, it deals with the skin problem quickly and effectively. A skin care formulation must be able to deliver the powerful agent into the skin to fulfill the intended objective.

Face serum is the answer to deliver the precious active ingredient into the skin thus eliminating the use of hazardous chemicals in giving, instant results. The skin serum are designed to penetrate the skin deeply and provide nourishment, hydration or address issues like wrinkles or pigmentation.

Face serum is a highly concentrated emulsion which is available in water based and oil based. Serums or Defined a concentrate, contain approximately ten times more of biologically active substances than creams, Therefore allows better skin problems treatment. Incorporating a few drops of face serum with daily skin care Routine will deliver noticeable results within a month or less. This is because face serums are made of very Small molecules that help it to penetrate deep into the skin quickly.

Skin is a protective and largest organ of body which is struggles to heal and repair itself 24 hours, but Sometimes skin can develop dry patches for many reasons like UV rays, pollutants, makeup left on overnight Can cause irritation or allergic reactions. The facial serum includes several ingredients associated with Improvement in the appearance of fine lines and wrinkles and increased barrier function including a neuro Peptide.

### HISTORY OF FACE SERUM

As defined in the dictionary – a serum is the clear, yellowish fluid obtained upon separating whole Blood into its solid and liquid components after it has been allowed to clot, so it is not surprising that the Precursors of modern-day serums were based on horse blood, egg albumin, and bovine placenta. Packaging these products in sterile ampoules preserved with oxyquinoline (and later, the invention of Parabens) made them available commercially. This is a practice that stayed with us since the early days of short Product shelf life, which meant small batches had to be made and used up quickly before the product spoiled. Exercise, cleanliness, and skincare were all held in high regard during the 1800s. Zinc oxide was used to lighten Skin, but often caused allergic reactions.

### TYPE of SERUM

#### 1.The oil serum



The oil serum is the simplest to make of all the face serums. It often starts with a base of just premium, fast absorbing carrier oils, also referred to as “dry” oils. In addition to having moisturising and barrier-repairing Characteristics, the premium oils used in the serum also include polyphenols, essential fatty acids, and other Substances that may be broken down by the skin

#### 2.The gel serum



Gel serums provide the skin a "tightening" sensation, giving your consumer the impression that their skin is momentarily lifted or tightened in particular regions of the face. The gel serum provides you the chance to include some fantastic water-based (hydrophilic) plant extracts because this formulation is water-based,

### 3.The Water based serum



Water-based serums are comparable to gel serums, although they may contain none or very little gums and Thickeners. To administer high-performance hydrophilic plant extracts that are trapped against the skin beneath A cream or lotion, you would utilise a water-based face serum. Layering an anti-ageing face mist under an Emulsion and then under an oil is the ideal technique to promote Higher penetration of water-based compounds into the skin, delivering their high performance elements slightly Deeper into the layers of the skin. The oils will form an occlusive barrier that will promote higher component Penetration.

### 4.The emulsion serum serum



An emulsion-based face serum is a moisturiser that strengthens the skin's barrier function while also delivering high performance components to the skin. Two "immiscible" phases-phases like oil and water that don't want to mix-are combined in an emulsion. An emulsifier is used to bind water and oil together and retain them in a stable state.

The best chance of delivering high performance actives deeply into the tissues of the skin is through an emulsion. Given the skin's barrier function, it is highly difficult for any cosmetic component to penetrate the Dermis, yet an oil and water mixture is best suited to accomplish this remarkable feat. The skin's barrier function Will be strengthened by the emulsion's moisturising characteristics.

## 5.The pressed balm serum



A balm serum has a conventional balm basis of butters, waxes, and oils but also includes active substances that are oil-soluble (lipophilic) and may help the skin. The butters and waxes form an occlusive barrier on the skin that hydrates and nourishes it while allowing the pressed serum's active components to do their job. In a balm serum, dozens of intriguing unique butters and waxes can be combined with thousands of exquisite plant oils.

### Advantages

- Improves skin texture
- Improve skin elasticity
- Hydrates and Nourishes the skin
- Helps to reduce Hyperpigmentation
- This serum is absorb quickly
- Soften fine line
- Shields skin from sun damage
- Fights free radicals

### Disadvantages

- For these people, serum may penetrate too quickly, causing irritation
- The liquid or gel-like texture of a serum can be a poor match for people with chronic skin Conditions like eczema or rosacea, which weaken the skin barrier.

### Formulation of facial serum

The formulation of facial serum involves carefully selection and combining ingredients to create a product that addresses specific skincare concerns and delivers desired benefits. Here's a basic outline of the formulation process;

#### 1. Active ingredient selection

Identify key active ingredient based on their skin care benefits. These could include botanical extract, vitamins and other compounds known for their moisturizing, anti aging, brightening or soothing property.

The formulation of a facial serum involves carefully selecting and combining ingredients to create a product that addresses specific skincare concerns and delivers desired benefits. Here's a basic outline of the formulation process:

## 2. Base Ingredients:

Choose a base or carrier for the serum, such as water, aloe vera gel, or a combination of water and glycerin. This forms the bulk of the product and helps deliver the active ingredients to the skin.

## 3. Emulsifiers and Stabilizers:

Add emulsifiers and stabilizers to ensure that the ingredients blend together smoothly and maintain their stability over time. Common emulsifiers include cetearyl alcohol.

## 4. Preservatives:

Incorporate preservatives to prevent microbial growth and extend the shelf life of the serum. Examples of preservatives include phenoxyethanol.

5. **Fragrance and Color:** Optionally, add fragrance or natural essential oils for scent, and colorants for aesthetic appeal. Keep in mind that fragrance can be sensitizing for some individuals, so consider using minimal amounts or opting for fragrance-free formulations.

## 6. Testing:

Conduct stability and compatibility tests to ensure the formulation remains stable over time and does not cause adverse reactions. This may involve testing for pH levels, microbial contamination, and skin irritation.

## 7. Packaging:

Select appropriate packaging to preserve the efficacy of the serum and protect it from light, air, and contamination. Dark-colored glass bottles with airtight pumps or droppers are commonly used for serums to minimize exposure to light and air.

## 8. Regulatory Compliance:

Ensure compliance with regulatory standards and labeling requirements for skincare products in your target market. This may include listing all ingredients, indicating usage instructions, and adhering to safety guidelines.

By carefully formulating a facial serum with high-quality ingredients and following good manufacturing practices, it's possible to create an effective and safe product that addresses specific skincare needs. Additionally, conducting thorough research and consulting with skincare professionals can help inform the formulation process and enhance the efficacy of the final product.

## Method of preparation

### 1) Preparation of oil phase

The oil soluble ingredients such as vitamin e capsule, coconut oil are taken into one beaker and melted at 70°C

### 2) Preparation of water phase

The water phase is prepared at same time by mixing aloe vera gel, rose water and green tea extract in another beaker.

### 3) Preparation of emulsion

Emulsion was prepared by adding oil phase into water phase drop wise under mechanical steering at 700 to 800 rpm to obtain O/W biphasic emulsion.



#### ❖ Active ingredient used in herbal face serum

##### I. Aloe vera gel



- Aloe stimulates fibroblast which produces the collagen and elastin fibers making the skin more elastic and less wrinkled.
- It has antioxidant and antibacterial property.
- Aloe vera has been used to treat wounds and infections.
- It block UVA and UVB rays and maintain skin natural moisture balance.
- It stop the sunburn and stimulate immune system intervention.

##### II. Rose water



- Rose water can be used to lighten the skin pigmentation.
- Rose water can remove oils and dirt from your skin.
- It helps to maintain pH level
- Rose water is said to be a natural skin toner due to this amazing PH – balancing properties.

## II. Green tea extract



- It has skin purifying properties that help make your face look clearer and brighter.
- Green tea contains many antioxidant such as flavonoids Authocynin and polyphenols.
- Helped calm itching and general irritation.

## III. Vitamin E capsule



- Provide extra protection against acute UVB damage
- Vitamin E is an antioxidant, which helps to protect your cells

## IV. Coconut oil



- Reducing inflammation, keeping skin moisturized and helping heal wounds
- It is used as a moisturizer and remove dead skin cells

**Material and collection**

Sr. no	Ingredients	Collection	Category
1	Aloe vera gel	Nandkumar shinde College of pharmacy vajapur	Anti aging
2	Rose water	Nandkumar shinde College of pharmacy vajapur	Hydrating agent
3	Green tea extract	Local market	Antioxidant
4	Vitamin E capsule	Medical store	Antioxidant
5	Coconut oil	Local market	Moisturizer

**Composition of face serum**

Ingredients	Formula
Aloe vera gel	10 gm
Rose water	4 ml
Green tea extract	8 ml
Vitamin e capsule	4 gm
Coconut oil	<b>4 ml</b>

**EVALUATION OF FACE SERUM****Physical Evaluation :**

The Colour and appearance of the formulation was observed visually. The formulation procedure uniform Distribution of extracts. This test was confirmed by visual appearance and by touch.

**pH Value :**

A pH meter was calibrated using a standard buffer solution. Nearly 1 ml of the face serum was properly Weighed and dissolve in 50 ml of distilled water and finally its pH was calculated. The skin has an acidic range and the pH of the skin serum should be in the range of 4.1-6.7.

**Determination of Spreadability :**

2 gm of serum sample was placed on a surface. A slide was attached to a pan to which 20 gm weight was Added. The time (seconds) required to separate the upper slide from surface was taken as a measure of Spreadability.



### Microbial Examination of the Product :

In this method, the mixed culture is diluted directly in tubes of liquid agar medium. The medium is Maintained in a liquid state at a temperature of 45°C to allow thorough distribution of the inoculum. The Inoculated agar medium is transferred into petri plates, allowed to solidify and incubated. In the series dilution Technique, the original inoculum may be diluted by using sterile water or saline solution so that the Concentration of the microbes gradually become less. Mix 1 ml dilute in 20 ml of liquid nutrient agar medium at 45°C. Shake the liquid agar nutrient agar medium & pour in a sterile petri plate, solidify and incubate it.

### Stability Studies :

Formulation and development of a pharmaceutical product is not complete without proper stability Analysis carried out on it to determine physical and chemical stability and thus safety of the product. The stability studies is carried out as per ICH guidelines. Short term accelerated stability study was Carried out for the period of few months for the prepared formulation. The samples were stored at different storage conditions of temperatures such as 3-5oC, 25oC RH=60% and 40oC±2% RH=75%.

### Cyclical Temperature :

Test These test is not carried out at any fixed temperature and humidity. In this test, temperature was Changed cyclically every day. At room temperature and frizzing temperature to stimulates the changes in Temperature.

### Physical evaluation

Colour	White
Odour	Characteristic odour
Taste	Tasteless
Texture	Smooth homogenous
Homogeneity	Good
PH	5
Washability	Washable

### pH Value:

The pH of formulation was found to be 6.4. As the skin having an acidic pH around 4.1-6.7, this range of Formulation is suitable for skin.

### Determination of Spreadability :

Spreadability of liquid formulation that is ability of the face serum to spread over the skin and play Important role in administration of standard dose of medicament formulation on skin. Spreadability of face serum 5 to 6 cm was found.

### Determination of Viscosity :

Viscosity is a critical parameter for topical formulation. Topical solutions with low viscosity have faster Clearance than viscous solutions. In addition, highly viscous solutions can have an undesirable effect on the Skin. Viscosity of the Face Serum was found to be 13759 Pa. s

### Microbial Examination of the Product :

The formulation was free from microbes as they do not show zone of inhibition, when they got inoculated In the agar

### Stability studies

Visual Appearance	White
Phase separation	Nil

### Cyclic Temperature Test

Sr no	Parameter	Suitability
1	Freezer temperature	Unstable
2	Room temperature	Stable

### Application of facial serum

#### A herbal face serum can have various applications, including:

- **Moisturizing** : Many herbal serums contain hydrating ingredients like hyaluronic acid or aloe vera, which help to keep the skin moisturized and supple.
- **Anti-aging** : Some herbal serums are formulated with antioxidants such as vitamin C or green tea extract, which can help reduce the appearance of fine lines and wrinkles by fighting free radicals.
- **Brightening** : Ingredients like licorice extract or kojic acid in herbal serums can help to brighten the skin and fade dark spots or hyperpigmentation.
- **Balancing**: Herbal serums containing ingredients like chamomile or calendula can help soothe and balance the skin, making them suitable for those with sensitive or irritated skin.
- **Repairing**: Certain herbal ingredients like rosehip oil or sea buckthorn oil are rich in essential fatty acids and vitamins that can help repair and regenerate the skin, making it useful for addressing damage from environmental stressors or sun exposure.
- **Acne-fighting**: Herbal serums containing ingredients like tea tree oil or witch hazel can help to control excess oil production and prevent acne breakouts.

### Conclusion

The study attempted to develop herbal face serum using extract of green tea and examine their efficacy for manage specific skin concerns such as wrinkles, acne, dry skin and dullness.

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