

# A Comprehensive Review on Formulation and Evaluation of Sulphur Ointment by Utilisation of Simple Ointment

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**Abstract:** *Ointment is a semi-solid preparation usually containing a medicinal substance, typically applied to the skin. It's used for various purposes, such as treating wounds, rashes, or skin conditions like eczema. Ointments provide a protective barrier on the skin, helping to retain moisture and enhance absorption of the active ingredients. They can come in various forms, such as petroleum-based or water-based, depending on the desired application and effect. Ointments are often preferred for their emollient properties, making them especially effective for dry or irritated skin. They can also have soothing effects due to their cooling or warming sensations, depending on the ingredients used. Additionally, ointments typically have a longer shelf life compared to creams or lotions. Some ointments contain ingredients like antibiotics or steroids to treat infections or inflammation, respectively. Others may focus on moisturizing agents like lanolin or petroleum jelly to soothe and hydrate the skin. It's important to follow the instructions provided by healthcare professionals or on the product label to ensure safe and effective use. Ointments have been used for centuries across various cultures for treating a wide range of ailments, from minor cuts and burns to skin infections and inflammatory conditions like eczema and psoriasis. They're valued for their soothing properties and ability to deliver medication directly to the affected area, reducing systemic side effects. Additionally, some ointments contain ingredients like emollients or moisturizers, which help hydrate and soften the skin*

**Keywords:** Smart Farming Monitoring System

## I. INTRODUCTION

Ointments are versatile and can be formulated to suit different needs, including those of sensitive skin or specific conditions. They can be water-based or oil-based, depending on the desired properties and the intended use. Some ointments are also designed for specific purposes, such as antifungal ointments for treating fungal infections or antibiotic ointments for preventing infection in wounds. Overall, ointments play a significant role in dermatology and wound care, providing effective relief and promoting healing. Ointment is a semisolid preparation used for external application to the skin or mucous membranes. It's typically a blend of an active pharmaceutical ingredient (API) and a base, which can be oily, water-based, or an emulsion. Ointments are designed to deliver medication directly to the affected area, providing local relief for conditions like rashes, cuts, or infections. They're often thicker and greasier than creams or lotions, which helps them stay in place longer and provide a protective barrier on the skin. Ointments can vary in consistency, from soft and easily spreadable to firmer and more occlusive, depending on their intended use and formulation. Ointments can be categorized based on their composition, such as oil-based (oleaginous), water-based (aqueous), or a combination of both (emulsion). Each type offers unique benefits: oil-based ointments are more occlusive and suitable for dry skin, while water-based ointments are less greasy and may be preferred for certain skin types.[1] Additionally, ointments can contain various additives like preservatives, fragrances, or stabilizers to enhance their efficacy and shelf life. Overall, ointments are versatile topical medications widely used in dermatology, wound care, and other medical specialties. Sulfate ointments typically contain an active ingredient such as zinc sulfate, magnesium sulfate (Epsom salt), or copper sulfate, among others. These compounds are commonly used for their

antiseptic, astringent, or drying properties. Sulfate ointments may be applied topically to treat various skin conditions such as eczema, dermatitis, or minor wounds.[3] They can help reduce inflammation, control infection, and promote healing. It's important to use sulfate ointments as directed by a healthcare professional to avoid potential irritation or adverse reactions. Sulfate ointments are formulated to deliver the active sulfate compound directly to the affected area of the skin. Zinc sulfate, for example, is known for its antimicrobial properties and can help soothe irritated skin and promote wound healing. Magnesium sulfate ointments, commonly known as Epsom salt ointments, are often used for their anti-inflammatory and muscle-relaxing effects, making them beneficial for conditions like sore muscles or minor sprains. Copper sulfate ointments may have astringent properties and can be used to dry out certain skin lesions or treat fungal infections.[5] However, it's essential to use sulfate ointments cautiously and as directed, as excessive use or misuse can lead to skin irritation or other adverse effects. Consulting with a healthcare professional is advisable for proper diagnosis and treatment recommendations. Sulfate ointments are versatile in their applications, often used not only for skin conditions but also in veterinary medicine for treating wounds and infections in animals. They can be found in various formulations, including creams, gels, and pastes, tailored to specific needs and preferences. Some sulfate ointments may also incorporate additional ingredients like emollients or moisturizers to help hydrate and protect the skin while delivering the therapeutic benefits of the sulfate compound. It's important to follow the instructions provided by healthcare professionals or product labels for safe and effective use.[7]

**Method of Preparation:**

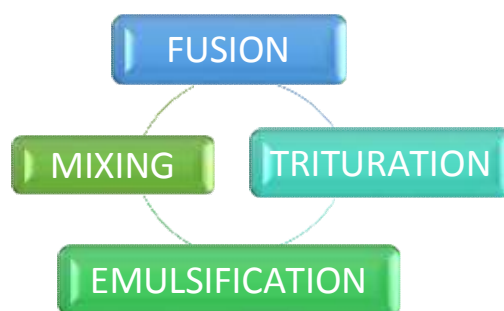


Fig. 1. Method of preparation

**II. MATERIALS AND METHODS**

Materials<sup>33,34</sup>

These are the following chemicals used for the formulations and evaluation of Sulphur ointment[2]

Table. 1. Ingredients used in the preparation of ointment and their use n

SL.NO	INGREDIENTS	ROLES
1	Wool fat	It act as base
2	Hard paraffin	Used to increase hardness of the formulation
3	Cetostearyl alcohol	Maintain the consistency of the formulation
4	White soft paraffin	Emollient and protective
5	Sublimed sulphur	scabicial agent

**Wool fat**

It act as base for the formulation also act as emollient in the preparation[2]



Fig 2: wool fat

**Hard paraffin**

Used to increase hardness of the formulation



Fig 3: Hard paraffin

**Cetostearyl alcohol**

It is used to maintain the consistency of the formulation.



Fig 4: Cetostearyl alcohol

**White soft paraffin**

It act as both emollient and protective in the formulation



Fig 5: White soft paraffin

Sublimed sulphur  
Act as scabicial agent



Fig 6. Sublimed sulphur

**Preparation of Simple ointment**

Table No 2: Formulation of simple ointment

SL.NO	Ingredients	Quantity
1	Wool fat	5 g
2	Hard paraffin	5 g
3	Cetostearyl alcohol	5 g
4	White soft paraffin	85 g

Melt the hard paraffin and cetostearyl alcohol on a water bath.  
To this add wool fat and white soft paraffin and stir well till the completion of the melting of all the ingredients.  
Examine the contents for any foreign particles and decant if required.  
Stir the mixture thoroughly until becomes cool  
Pack the preparation, label and dispense it.[5]

**Category:-** Protective, Emollient  
Preparation of Sulphur ointment

Table No 3: Formulation of sulphur ointment

SL.NO	Ingredient	Quantity
1	Sublimed sulphur	10 g
2	Simple ointment	90 g

Triturate the sublimed sulphur, finely sifted with small amount of simple ointment over an ointment slab.  
Gradually add the remaining quantity of simple ointment with thorough trituration until a homogenous mass is obtained.[9]  
Pack, label and dispense the preparation.

**Simple Ointment:**

A simple ointment typically consists of a base like petroleum jelly or beeswax combined with an active ingredient like a medication or herbal extract. They're commonly used for minor skin irritations, cuts, or dryness. Sure, simple ointments are versatile and easy to make. They often include ingredients like coconut oil, shea butter, or cocoa butter as a base, combined with essential oils or medicinal herbs for their therapeutic properties. They can be customized based on the desired effect,[11] whether it's moisturizing, soothing, or healing. Homemade ointments are popular for their natural ingredients and potential cost savings compared to commercial products.

**Storage:**

Store in a closed container at room temperature, away from heat, moisture, and direct light. ~~Keep from freezing.~~

**Dose:**

Use the 5 to 10% ointment one or two times a day. Use as required.

**Direction:**

Do not apply on broken skin and near the eye.

**Precautions:**

Avoid getting this medicine in your eyes, nose, mouth, or on your lips. O Rinse with water if contact does occur. Do not use on open wounds or on sunburned, wind burned, dry or irritated skin.

Keep away from children.

**Category:-** Scabicedal agent

Evaluation of ointment

**Physical Appearance**

Physical parameter of ointment such as colour and appearance were evaluated

**Determination of viscosity**

The viscosity of gel was determined using a Brook field viscometer. Viscosity was measured by spindle No 10 immersed in the sample. The test was carried out at 25<sup>0</sup>c, and spindle was rotated at 10 rpm. The reading was recorded for the formulation. Viscosity is one of the important parameter of semisolid preparation. It should be such that the product can be easily removed from the container and easily applied to the skin. Cone and plate viscometer or Brookfield viscometer is used to determine the viscosity of the preparation.[15]

**Determination of pH**

The accurately weighed amount of ointment (2.5g) was dispersed in 25 ml distilled water. The pH was recorded by using digital pH meter at room temperature.[13]

**Homogeneity**

The homogeneity of ointment was confirmed by visual inspection after the ointment has been set in a container for their appearance and presence of any aggregates.

**Extrudability**

The ointment formulation was filled in standard capped collapsible aluminium tube and sealed by crimping to the end. After recording the weight of the tube it was then placed between two glass slides and were clamped.500gm were placed over the slides and then the cap was removed. The amount of the extruded gel was collected and record the weight. The percentage of extruded ointment was calculated as,[12]

When it is greater than 90%, then the extrudability is excellent.

When it is greater than 80%, then the extrudability is good.

When it is 70%, then the extrudability is fair.

**Washability**

The ointment was applied on hand and was observed under running tap water.

**Presence of foreign particles**

Here we are checking if the developed product containing presence of any particles.

**III. RESUL AND DISCUSSION**

**Evaluation of Ointment**

Prepared ointment was inspected visually for their characters like colour, consistency and appearance.

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**Physical Appearance**

The formulated ointment showed good physical characteristics like good consistency and absence of air bubbles. Post Application feel was found to be Smooth and comfortable on application.[13]

Table No 5: Physical appearance of sulphur ointment

colour	White,light yellow
odour	<b>Pungent, distinct, aromatic</b>
consistency	<b>Smooth</b>

**Determination of viscosity**

The viscosity of the ointment formulation refer to its consistency, and was measured by using Brookfield viscometer with spindle number 6 at 10 rpm at room temperature.

Table No. Viscosity of ointment

	Viscosity Trials			Average Viscosity(cp) ± SD (n=3)
	1	2	3	
	12200	12500	12800	12500 ±0.45

**Determination of pH**

The pH of the formulation was measured using digital pH meter, which is given in the table. The value lies in the normal pH range of the skin.

Table No 7: pH of ointment

pH Trials			Average pH ± SD (n=3)
1	2	3	
5.5	6.8	6.7	6.4 ± 0.12

**Homogeneity**

The optimized ointment was tested for homogeneity by visual inspection after setting the ointment in a suitable container and checked the presence of any aggregates. The ointment showed good homogeneity devoid of lumps. And also possesses uniform distribution.

**Extrudability**

In extrudability studies, about 80% of the ointment was extruded from the collapsible aluminium tube. This indicated that the extrudability characters of the optimized gel was good.[17]

**Washability**

The ointment when applied on skin, it was easily removed by washing with tap water.

Table No 8: showing homogeneity, extrudability, washability

Parameters	Observations
Homogeneity	homogeneous
Extrudability	good
Washability	good

**Presence of foreign particles**

The developed ointment is free from any foreign particles.

**IV. CONCLUSION**

Ointment are getting popularity now a day. They are viscous semisolid preparation mainly for external application. The main advantage of ointment is which allow incorporation of drug and are chemically stable and easy to handle than liquid dosage. Here in this article by using ingredients like wool fat, hard paraffin, cetostearyl alcohol and white soft paraffin simple ointment was prepared and by adding sulphur to the above preparation sulphur ointment was prepared,

packed labelled and dispensed. The clinical evidence show that ointment are safe and efficient way of treatment for diseases.

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