

DERMATOLOGICAL FORMULATIONS: OINTMENTS CREAMS AND PASTES

DERMATOLOGICAL
FORMULATIONS:

مركبات
OINTMENTS CREAMS AND
PASTES

ointment : semisolid / oily

مركبات حكي الكثرة
الخارجي

سنوات + اسلته قويه * good luck

By
Raneem
Al-Sayouf

Rationale for Dermatological Formulations– why a treatment is given locally to the skin?

1. To enhance barrier function of the skin.

2. **Targeted delivery** to specific layers of the skin.

local systemic (subcutaneous)

- Fungal infections are in the outermost part of skin.

- Eczema need to deliver drugs deeper into the skin.

3. To provide a topical vehicle for medications for local

local treatment

(anti-infective, anti-pruritic, astringent, keratolytic).

→ tightens tissues and reduce oiliness

مضاد للحكة

لا دغ

قرنية

4. Fewer side-effects compared with oral delivery of drugs (to treat skin conditions).

Keratolytic

How do formulations improve skin's barrier function?

- Sunscreens protect against UV radiation.
- Antibiotics ^{جروح} for abrasions protect against infection.
- ☆ ● Emollients improve dry skin conditions. (prevent water loss)
- ☆ ● Moisturisers protect against drying atmospheric conditions.
- Barrier creams prevent exposure of skin to chemical or physical irritants in the environment thus permit the skin to rejuvenate and heal (hair stylists' creams for instance)

Dermatological Formulations

- Ointments, creams, pastes and gels are semisolid dosage forms intended for topical application.
- They are also termed "semisolids" because they appear to be solid but still have fluid properties
- They may be applied to the ¹skin, placed on the surface of the ²eye, or used nasally, ³vaginally, or ⁴rectally.
- Topical applications can be designed for either local effects or systemic absorption
- A topical dermatological product is designed to deliver drug into the skin in treating dermal disorders, with the skin as the target organ.

- Pharmaceutical creams are ^{liquid + solids} semisolid preparations containing one or more medicinal agents dissolved or dispersed in either a w/o emulsion or an o/w emulsion
- Many patients and physicians prefer creams to ointments because they are easier to spread and remove.

Structure of the skin

- The skin is the largest and heaviest organ in the body and accounts for about 17% of a person's weight.
- Its major function is to protect the underlying organ systems from trauma, temperature, humidity, harmful penetrations, moisture, radiation, and microorganisms.
- It is composed of three layers of stratified tissue: epidermis, dermis, and subcutaneous tissue.
- The thickness of the skin is 3 - 5 millimeters. The thickness of the skin varies with the different parts of the body.
- Within the structure of the skin are several skin appendages: hair follicles, sebaceous glands, sweat glands, and nails.

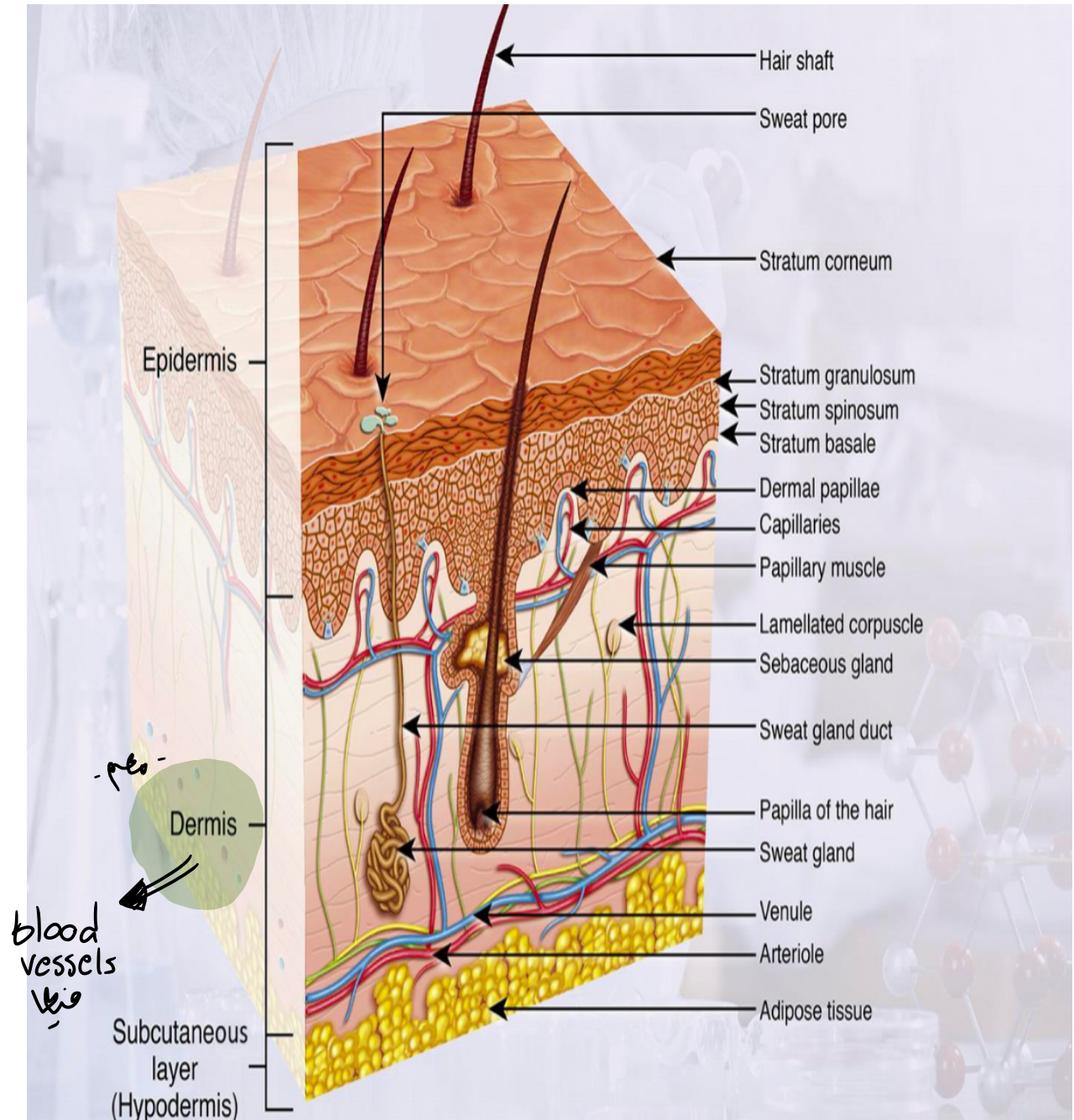
"lipophilic"

- Stratum corneum is outer layer of epidermis.

- ✱ ◦ Blood vessels are present in the dermis but not the epidermis.

- Sweat glands, hair follicles and sebaceous glands originate in the dermis.

- The subcutaneous layer is fatty tissue that acts as "cushion" for the skin.



Which layer of the skin is characterized by the absence of blood vessels and contains the stratum corneum as its outermost part?

A. Dermis

B. Subcutaneous tissue

C. Hypodermis

D. Epidermis

D

Absorption

Local and systemic effects of Dermatological Formulations:

- Dermatological formulations produce a local drug effect either on or in the skin. *both local*
- Besides the specific therapeutic action of incorporated active drugs, the formulations also serve as protectants, lubricants, emollients, or drying agents.
- Examples of treatments using dermatological formulations include minor skin infections, itching, burns, diaper rash, insect stings and bites, athlete's foot, corns, calluses, warts, dandruff, acne, psoriasis, and eczema.

بثور

قشرة الرأس

*chronic disease
(red patches)*

(dermatology) hardened skin area from repeated friction

(medical) small rough growth on the skin caused by a virus

CORNS AND CALLUSES

CORNS

CALLUSES



Local and systemic effects of Dermatological Formulations:

- Some dermatological formulations are intended to systemically deliver a drug.
- The formulation is placed on the skin, and the drug penetrates the epidermis into the dermis and subcutaneous tissues, where it is absorbed into the systemic circulation
- Some dermatological formulations provide ^{through skin} continual percutaneous absorption (i.e. transdermal patch)
- Percutaneous (through the skin) absorption is the result of three competing processes: *the amount of drug absorbed depends on these:*
 - the potential of the drug to leave the formulation
 - the potential of the drug to cross the stratum corneum (*outer most layer*) *lipophilic is better*
 - the influence of the formulation on the stratum corneum.

Percutaneous absorption

- More drug is absorbed when the formulation is applied to a larger surface area ↑
- Formulations or dressing that increase hydration of the skin generally enhance percutaneous absorption
- The greater the amount of rubbing the formulation, the greater is the absorption
- The longer the formulation remains in contact with the skin, the greater is the absorption

Factor	Relationship with Absorption
Surface area of application ↑	Absorption ↑
Skin hydration ↑	Absorption ↑
Rubbing/Massage ↑	Absorption ↑
Contact time on skin ↑	Absorption ↑

Occlusive vs non-occlusive topical formulations

تعمل
زي
locking in

- **Occlusive** means that the formulation prevents water movement out of the body. So an occlusive preparation increases skin hydration and moisture content by “locking in” the water present in the body

- Good for dry skin but bad for infected skin
- Enhances skin barrier as forms a “shield” on skin
- Good penetration of drugs through the skin

hydration ↑
Absorption ↑

Ointments

- Traditionally the term ointment has been used for (i) the general class name for all external-use semisolids and (ii) the subclass, oleaginous semisolids.
- *USP 31* Chapter <1151> defines ointments very generally as “semisolid preparations intended for external application to the skin or mucous membranes”. *too broad*
- *oleaginous ointments*
Two types of ointments for the skin. **First type** is composed of **hydrocarbons** from petroleum or other oils which **are not water soluble**.
- Soft paraffin is most common ingredient but liquid paraffin (mineral oil) or hard paraffin used to thin or thicken formulation

Q1. What is the most common ingredient in oleaginous ointments?

- Soft paraffin (petrolatum)

Q2. Which ingredient is added to thin an ointment?

- Liquid paraffin (mineral oil)

Q3. Which ingredient is added to thicken an ointment?

- Hard paraffin

Q4. Are oleaginous ointments water-soluble?

- No

Oleaginous ointment Bases

no water just lipids

petrolatum
vasline
white petrolatum
white vasline
yellow ointment
white ointment

➤ Petrolatum, USP

- It is a purified mixture of semisolid hydrocarbons obtained from petroleum.
- vary in color from yellowish to light amber.
- It melts at 38°C to 60°C and may be used alone or in combination with other agents as an ointment base.
- Petrolatum is also known as yellow petrolatum and petroleum jelly.
- A commercial product is Vaseline.

Oleaginous ointment Bases

➤ *White Petrolatum, USP*

- *It is a purified mixture* of semisolid hydrocarbons from petroleum that has been wholly or nearly decolorized.
- It is used for the same purpose as petrolatum, but because of its lighter color, it is considered more esthetically pleasing by some pharmacists and patients.
- White petrolatum is also known as white petroleum jelly.
- A commercial product is White Vaseline

جابت مجموعه خيارات وكان بدھا الخطأ

للpetrolatum

وكان الجواب purified mixture of liquid

hydrocarbon

Oleaginous ointment Bases

➤ *Yellow Ointment, USP:*

- *This ointment has* the following formula for the preparation of 1000 g:
 - Yellow wax 50 g
 - Petrolatum 950 g
- Yellow wax is the purified wax obtained from the honeycomb of the bee *Apis mellifera*.

Oleaginous ointment Bases

➤ *White Ointment, USP.*

- *This ointment differs* from yellow ointment by substitution of white wax (bleached and purified yellow wax) and white petrolatum in the formula.

Oleaginous ointment Bases

- Hydrocarbon bases, known also as “oleaginous ointment bases”
 - Only small amounts of an aqueous component can be incorporated into these bases
 - Hydrocarbon bases ^① serve to keep medicaments in prolonged contact with the skin and act as occlusive dressings.

مركب الدوائي

Absorption Ointment Bases

➤ **Hydrophilic Petrolatum, USP,**

◦ It has the following formula for the preparation of 1000 g:

1. Cholesterol 30 g
 2. Stearyl alcohol 30 g
 3. White wax 80 g
 4. White petrolatum 860 g
- } emulsifying agents
w/o emulsion

All of the following are examples of **oleaginous ointment bases EXCEPT:**

- A. Petrolatum
- B. White Petrolatum
- C. Yellow Ointment
- D. Hydrophilic Ointment

Absorption ointment Bases

$H_2O \downarrow$

- **Lanolin**, USP (Anhydrous lanolin) obtained from the wool of sheep (*Ovis aries*), is a purified wax-like substance that has been cleaned, deodorized, and decolorized.
- It contains not more than 0.25% water.
- **Modified Lanolin**, USP, is lanolin processed to reduce the contents of free lanolin alcohols and any detergent and pesticide residues.

مبيد

وسؤال عن anhydrous lanolin لأي base يتبع
والجواب كأنه كان absorption ointment bases

Reply



Absorption ointment Bases

- Permit the incorporation of aqueous solutions with the formation of a water-in-oil emulsion (e.g., Hydrophilic Petrolatum and Anhydrous Lanolin, both USP).
- Cholesterol and Stearyl alcohol are added as emulsifiers

Water/Oil Emulsion Bases

*cold cream
hydrous lanolin*

- Are more correctly called “creams”.
- Consists of water-in-oil emulsions that permit the incorporation of additional quantities of aqueous solutions (Cold cream type, Hydrous Lanolin, USP).
- <http://www.cosmeticsandskin.com/aba/cold-cream.php>: refer to this article for the history of cold cream
- Why is it called cold cream? *Because evaporation of water from cream produce a cooling sensation*
- What is the role of borax in this formula?
 - reacts with beeswax fatty acids to form an emulsifier
 - stabilizes w/oil emulsion

What is the primary role of borax in the formulation of Cold Cream (a *w/o* emulsion)?

- A. It serves as a keratolytic agent to remove dead skin cells.
- B. It provides the characteristic "cooling" sensation of the cream.
- C. It reacts with fatty acids in beeswax to form an emulsifier.
- D. It acts as a preservative to prevent microbial growth.

easier washing / faster release

Oil/Water Emulsion Bases

hydrophilic ointments

- **Oil-in-water emulsions** (e.g., **Hydrophilic Ointment, USP**), and **are more correctly called “creams”**. *washable*
- They also are described as “**water-washable**” because **they may be readily washed from the skin or clothing with water** an attribute **that makes them more acceptable for cosmetic purposes.** *o/WATER emulsion*
- **Some medicaments may be more effective in these bases than in hydrocarbon bases.** Other advantages of the **water removable bases** are that **they may be diluted with water** and **that they favor the absorption of serous discharges** in dermatological conditions.

All of the following properties of o/w emulsion except:

1-non occlusive

2-non grassy

3-water washable

4-non miscible with water

الجواب: 4

Water-Removable Bases (o/w emulsion bases)

➤ Following formula for the preparation of about 1000 g:

<i>Ingredient</i> <i>Amount (grams)</i>		"ماده های پایه"
1.	Methylparaben 0.25	} preservative
2.	Propylparaben 0.15	
3.	Sodium lauryl sulfate 10.00	surfactant
4.	<u>Propylene glycol 120.00</u>	solvent / humidifier
5.	<u>Stearyl alcohol 250.00</u>	emulcifier
6.	<u>White petrolatum 250.00</u>	oily phase
7.	<u>Purified water 370.00</u>	water phase (External)

Gel

non occlusive

Water Miscible Ointment Bases

"greaseless"

- Water-miscible Bases—This group of so-called "greaseless ointment bases" comprises **water-soluble constituents**.

★ **Polyethylene Glycol Ointment NF** is the only pharmacoepial preparation in this group. ✓

Polyethylene Glycol Ointment NF is the only pharmacoepial preparation in water miscible group

- Bases of this type offer many of the advantages of the **water-removable bases** and in addition, contain **no water-insoluble substances** such as petrolatum, anhydrous lanolin, or waxes. They are more correctly called Gels.

o/w water emulsion

highest release rate

Absorption ointment Base

Water-Miscible Ointment Bases

كان بدو مثال ع water miscible bases
وكان الجواب polyethylene glycol

➤ *Polyethylene Glycol Ointment, NF*

- **PEG** is a polymer of ethylene oxide and water represented by the formula $\text{H}(\text{OCH}_2\text{CH}_2)_n\text{OH}$, in which n represents the average number of oxyethylene groups.
- The numeric designations associated with PEGs refer to the average molecular weight of the polymer.
- PEGs having average molecular weight below 600 are clear, colorless liquids.
 - below 600
 - clear
 - colorless liquids
- Those with molecular weight above 1,000 are wax like white materials; and those with molecular weight in between are semisolids.
 - above 100
 - wax like
 - white material
 - in between (600 - 1000)
 - Semisolid

Polyethylene Glycol (PEG) polymers with an average molecular weight above 1,000 typically exhibit which physical state at room temperature?

A. Semisolids

B. Volatile gases

C. Wax-like white materials

D. Clear, colorless liquids

C

SELECTION OF THE APPROPRIATE BASE (oleaginous, cream, gel)

1. Desired release rate of the drug from the ointment base

2. Desirability of topical or percutaneous drug absorption

3. Desirability of occlusion of moisture from the skin

4. Stability of the drug in the ointment base

5. Desire for a base easily removed by washing with water *o/w emulsion base*

6. Characteristics of the surface to which it is applied: an ointment is generally applied to dry, scaly skin; a cream is applied to weeping or oozing surfaces

leaking out slowly

Base	Release Rate	Occlusive Effect
Gel	Highest ↑↑↑	Lowest ↓↓↓
Cream	Intermediate ↑↑	Intermediate ↑↑
Oleaginous (ointment)	Lowest ↓	Highest ↑↑↑

When selecting a base for a dermatological condition, why might an *o/w* emulsion (cream) be chosen over an oleaginous ointment for a "weeping" skin surface?

- A. To provide a thicker occlusive shield
- B. To favor the absorption of serous discharges
- C. To prevent any water from penetrating the base
- D. To ensure the slowest possible drug release

B

وجابت سؤال عن لما تكون حالة الجلد dry and

scaly ايش المركب الي يستخدمه

Oleaginous ointment

SELECTION OF THE APPROPRIATE BASE

1. Oleaginous (hydrophobic) bases release drugs slowly and unpredictably because water cannot penetrate the base sufficiently to dissolve the drug *oily*
2. Water miscible and hydrophilic bases tend to release drugs more rapidly and more predictably because water can penetrate into the base
3. Once the drug has been released from the base the penetration through skin is influenced by the area to which the ointment is applied, the condition of the skin, the location, and method of application

The Best base for release sold and oleaginous drug

1-absorption base

2-W/o

3-O/W

4-water -miscible base

مش متأكدة من صيغة السؤال

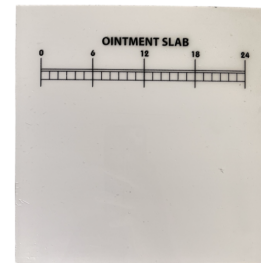
الجواب: 4

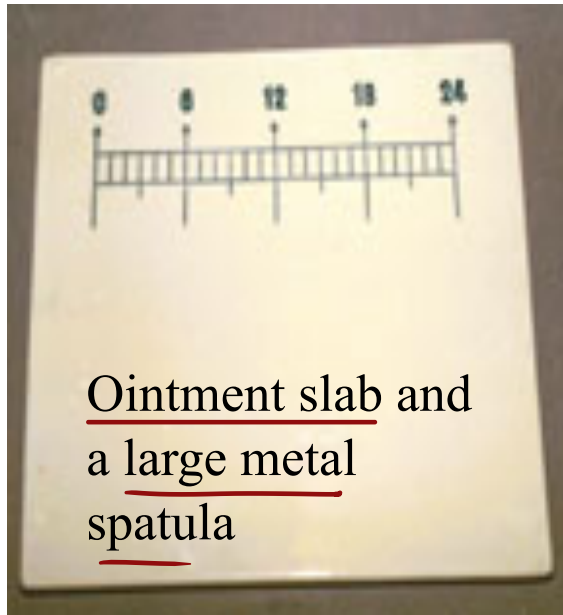
PREPARATION OF OINTMENTS

- incorporation
- fusion

1. Incorporation

- The components are mixed until a uniform preparation is attained.
- On a small scale, as in extemporaneous compounding, the pharmacist may mix the components using a mortar and pestle, or a spatula may be used to rub the ingredients together on an ointment slab (a large glass or porcelain plate or pill tile).
- Others will use an ointment mill





Ointment slab and
a large metal
spatula

Ointment mill



Incorporating a drug into an ointment base:

- Insoluble powders that are added into ointment base should be in the finest possible state of subdivision:

smaller particles

- Powder form used instead of crystalline form

- Triturate the powder in a mortar & pestle

- Levigating agents (miscible with the ointment base)

- Some powders are incorporated into ointment base by dissolving the solid in a low vapor pressure solvent or oil that can be taken up by the ointment base

Difference between trituration and levigation:

- Trituration: Reducing particle size by grinding.
- Levigation: Wetting and dispersing powder with a small amount of liquid to form a smooth paste before mixing into the base.

LEVIGATING AGENTS

The liquid, called a levigating agent, is somewhat viscous and has a low surface tension to improve ease of wetting the solid.

Levigating agents act as lubricating agents. They make incorporating solids easier, and they usually give smoother preparations.

Some drugs can be dissolved in:

- An oil.
- A low vapor pressure solvent.

The resulting solution is then incorporated into the ointment base.

boiling point ↑

we want to keep it from evaporating

كأنه كأنه جانب سؤال عن levigating agent
وانه لأي base يشتغل او يكون miscible مع ايش
miscible
with
ointment
base

- levigating, or mixing the solid material in a vehicle in which it is insoluble to make a smooth dispersion.
- The levigating agent (e.g., **mineral oil** for bases in which oils are the external phase, or **glycerin** for bases in which water is the external phase).

mineral oil w/o emulsion
glycerin o/w emulsion
- The levigating agent should be about equal in volume to the solid material.
- A mortar and pestle are used for levigation. This allows both reduction of particle size and dispersion of the substance in the vehicle.
- After levigation, the dispersion is incorporated into the ointment base by spatulation or with the mortar and pestle until the product is uniform.

In the process of levigation during ointment preparation, which agent would be most appropriate for a base where water is the external phase?

A. Glycerin

B. Yellow wax

C. Mineral oil

D. Hard paraffin

A

مثال على levigating agent

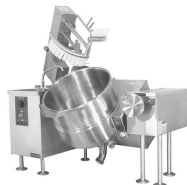
mineral oil
glycerin

Reply



2. Fusion *melting before mixing*

- By the fusion method, all or some of the components of an ointment are combined by being melted together and cooled with constant stirring until congealed. (تجمد)
- Components not melted are added to the congealing mixture as it is being cooled and stirred.
- On a small scale, fusion may be conducted in a porcelain dish or glass beaker.
- On a large scale, it is carried out in large steam jacketed kettles.



Fusion

- Once congealed, the ointment may be passed through an ointment mill (in large-scale manufacture) or rubbed with a spatula or in a mortar to ensure a uniform texture.
- The materials with the highest melting points are heated to the lowest required temperature to produce a melt. The additional materials are added with constant stirring during cooling of the melt until the mixture is congealed. In this way, not all of the components are subjected to the highest temperature.

00 : 13 : 35

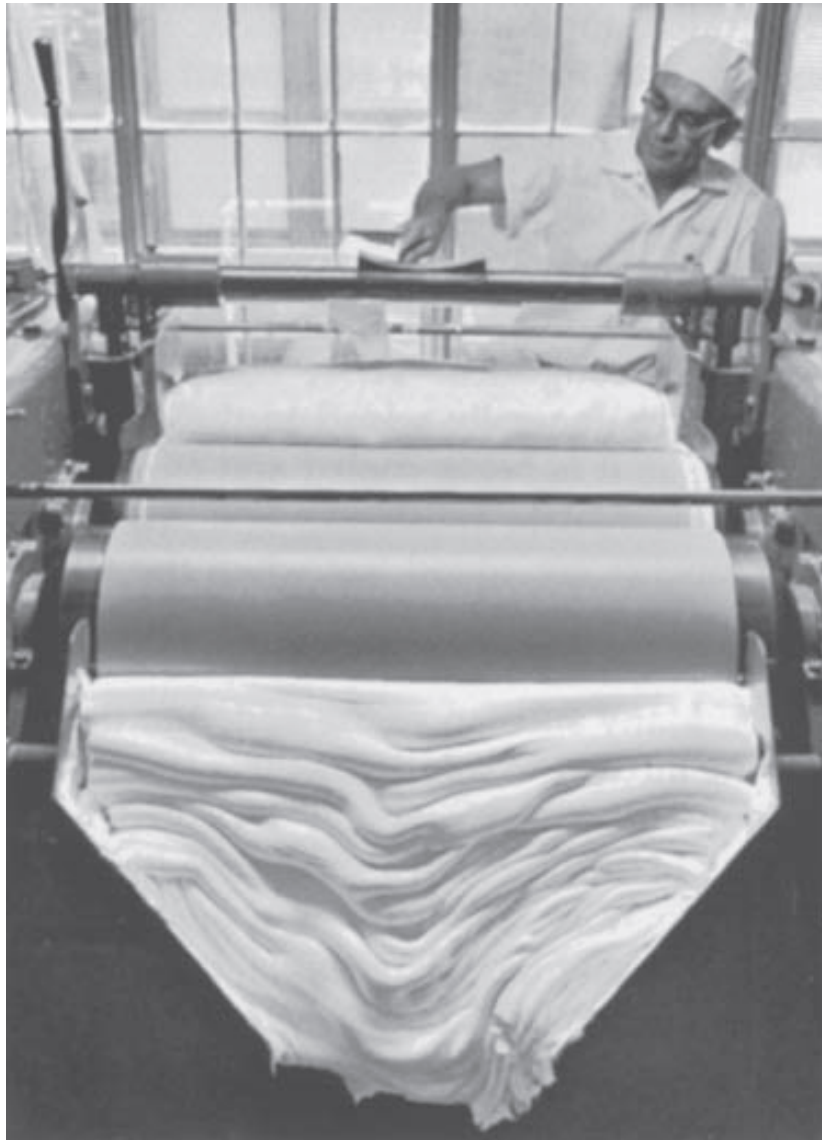
Question 12 / 50

Fusion method could be used to prepare emulsions

1. ☒ True
2. ☐ False

Next

إضافة ملاحظة



PASTES

ايش بختلف ال paste عن ointment
لانه في 25% solid material

- Pastes are semisolid preparations intended for application to the skin. They generally contain a larger proportion of solid material (such as 25%) than ointments and therefore are stiffer.
- Stiffer than ointments
- The stiffness ^{low release} reduce the percutaneous absorption potential of any drug incorporated in the paste
- They are used for their :
 - protective action
 - and ability to absorb serous discharge from skin lesions
 - and ability to remain in place longer than ointments
 - E.g. Zinc Oxide paste USP, Carboxymethylcellulose Sodium Paste USP, Triamcinolone Acetonide Dental Paste USP.

COMPENDIAL REQUIREMENTS FOR OINTMENTS

- Ointments and other semisolid dosage forms must meet USP tests for microbial content, minimum fill, packaging, storage, and labeling.
- Ophthalmic ointments must also meet tests for sterility and metal particles content.

MICROBIAL CONTENT

وانه ال opthalmic tube اشي هيك لازم يكون sterile
True

- With the exception of **ophthalmic preparations**, topical applications are not required to be sterile.
- They must, however, meet acceptable standards for microbial content, and preparations prone to microbial growth must contain antimicrobial preservatives.
- Dermatologic products should be examined for ***P. aeruginosa*** and ***S. aureus***, and ***those intended for rectal, urethral, or vaginal use*** should be tested for yeasts and molds

dermatologic products:

- *P. aeruginosa*

- *S. aureus*

rectal, urethral, vaginal products:

- yeast

- molds

4. Specific organisms to test for (very high yield)

A. Dermatologic (skin) products

Must be checked for:

- *Pseudomonas aeruginosa*
- *Staphylococcus aureus*

MINIMUM FILL (*net weight*)

- The USP's *minimum fill test* is *determination of the net weight or volume of the contents of filled containers to ensure proper contents compared with the labeled amount.*

PACKAGING SEMISOLID PREPARATIONS

- Topical dermatologic products are packaged in either jars, tubes, or syringes whereas ophthalmic, nasal, vaginal, and rectal semisolid products are almost always packaged in tubes or syringes.

- The so-called ointment jars are made of clear or opaque glass or plastic.

ointment jar
- opaque glass
- plastic

ointment tube
- aluminum
- plastic

- Ointment tubes are made of aluminum or plastic

The best package of ophthalmic ointment

1-plastic tube

tubes
syringes

2-plastic jar

3-plastic jar

4-wide mouth jar

5-plastic jar

PACKAGING, STORAGE, AND LABELING

(contamination)

well closed container

cool place

(separation in heat)

- Semisolid preparations must be stored in well-closed containers to protect against contamination and in a cool place to protect against product separation in heat.
- light-sensitive preparations are packaged in opaque or light-resistant containers.
- In addition to the usual labeling requirements for pharmaceutical products, the USP directs the labeling for certain ointments and creams include the type of base used (e.g., water soluble or water insoluble).

- Epoxy resin
- vinyl
- lacquer

PACKAGING, STORAGE, AND LABELING

- Tubes of aluminum generally are coated with an epoxy resin, vinyl, or lacquer to eliminate any interactions between the contents and the tube.

- Plastic tubes are made of high- or low-density polyethylene (HDPE or LDPE) or a blend of each, polypropylene (PP), polyethylene terephthalate (PET)

HDPE
LDPE
PP
PET

- HD - polyethylene
- LD - polyethylene
- polypropylene PP
- polyethylene terephthalate PET

Low

- LDPE is soft and resilient, and it provides a good moisture barrier. HDPE provides a superior moisture barrier but is less resilient. PP has a high level of heat resistance, and PET offers transparency and a high degree of product chemical compatibility.

1. Aluminum tubes used for topical preparations are coated mainly to:

- A. Improve flexibility
- B. Increase transparency
- C. Prevent interaction with contents
- D. Improve heat resistance

4. Which plastic provides the best moisture barrier?

A. LDPE

B. HDPE

C. PP

D. PET

B

PACKAGING, STORAGE, AND LABELING

- Packaging should keep the formulation clean during repeated use and as free from air exposure and microbial contamination as feasible
- Tubes, jars, applicators, syringes, patches, pump dispensers
- Jars does not meet the above requirements, thus a tongue depressor can be used to remove the required quantity of formulation and keep the formulation free from hand contamination
- Pastes are generally packed in ointments jars

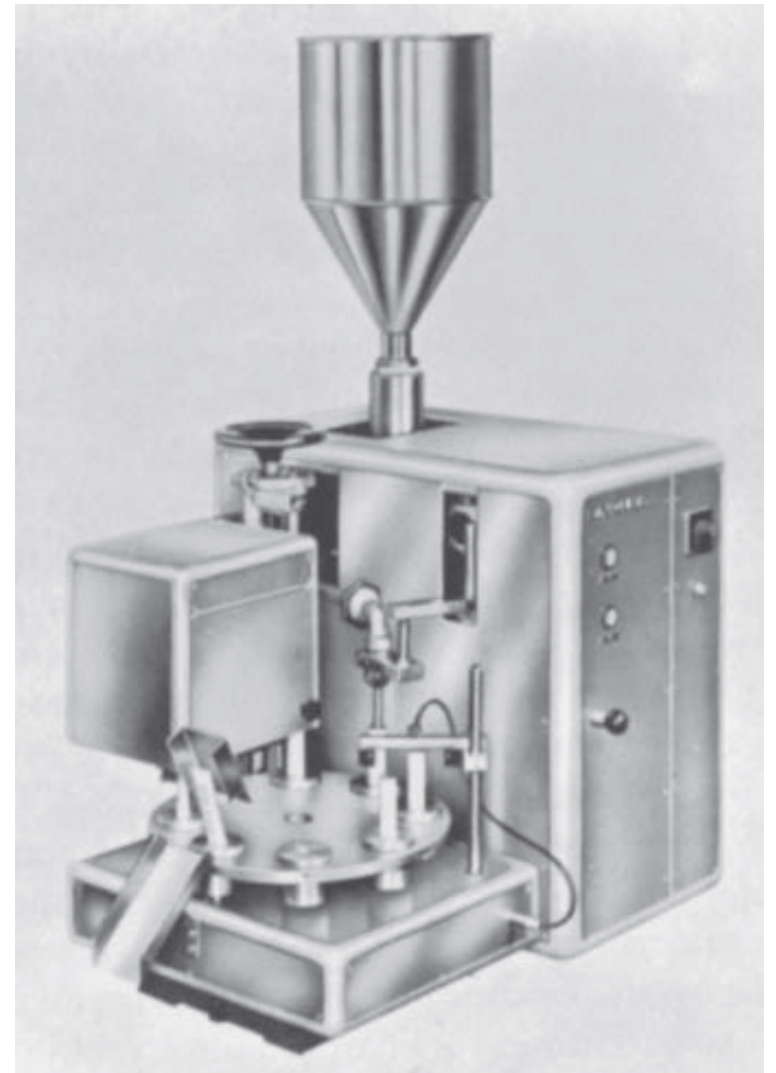
made of opaque glass
or plastic



Filling Ointment Tubes

- Tubes are filled from the open back end of the tube, opposite from the cap end.
- Ointments prepared by fusion may be poured while still soft but viscous directly into the tubes with caution to prevent stratification of the components.
- On a small scale, as in the extemporaneous filling of an ointment in the pharmacy, the tube may be filled manually or with a small-scale filling machine

الكونا
تفصيل



Evidence of instability

➤ Instability of various dermatological formulations can be identified by:

- A separation of components
- Discoloration
- Development of rancid odor فاسد
- Dryness
- Crystal growth
- Shrinkage
- Microbial contamination
- Additional instability signs for ointments:
 - Excessive bleeding (i.e. separation of excessive amounts of liquids)
 - Formation of granules or grittiness

Evidence of instability

- Anhydrous formulations tend to be more stable than hydrous products
- Anhydrous formulation can have a 6 month beyond use date if incorporated drug is stable for that period
- سواء ◦ For formulations containing water it is recommended that no more than a 2 week supply be dispensed if no preservative is used

Summary

- Differences in emollient and occlusive effects and ease of application and removal between products is a factor of the base used and product type.
- As noted earlier, oleaginous bases provide greater occlusion and emollient effects than do hydrophilic or water-washable bases.
- ☆◦ Pastes offer even greater occlusion and are more effective than ointments at absorbing serous discharge.
- Creams, usually oil-in-water emulsions, spread more easily than ointments and are easier to remove.
- Water-soluble bases are nongreasy and are easily removed.

أهم صفات بالشابل كلت	Oleaginous Ointment Bases	Absorption Ointment Bases	Water/Oil Emulsion Ointment Bases This is correctly classified as cream	Oil/Water Emulsion Ointment Bases This is correctly classified as cream	Water-miscible Ointment Bases More correctly called gels
Composition	oleaginous compounds	oleaginous base + w/o surfactant	oleaginous base + water (< 45% w/w) + w/o surfactant (HLB ≤ 8) ^{أقل من 8} hydrophilic lipophilic balance	oleaginous base + water (> 45% w/w) + o/w surfactant (HLB ≥ 9) ^{أكثر من 9}	Polyethylene Glycols (PEGs) solvent humidifier
Water Content	anhydrous	anhydrous	hydraous	hydraous	anhydrous, hydraous
Affinity for Water	hydrophobic	hydrophilic	hydrophilic	hydrophilic	hydrophilic
Spreadability	difficult	difficult	moderate to easy	easy	moderate to easy
Washability	nonwashable	nonwashable	non- or poorly washable	washable	washable
Drug Incorporation Potential	solids or oils (oil solubles only)	solids, oils, and aqueous solutions (small amounts)	solids, oils, and aqueous solutions (small amounts)	solid and aqueous solutions (small amounts)	solid and aqueous solutions
Drug Release Potential*	poor	poor, but > oleaginous	fair to good	fair to good	good
Occlusiveness	yes	yes	sometimes	no	no
Uses	protectants, emollients (+/-), vehicles for hydrolyzable drugs قابل للتحلل للماء	protectants, emollients (+/-), vehicles for aqueous solutions, solids, and non- hydrolyzable drugs Absorption ointment base	emollients, cleansing creams, vehicles for solid, liquid, or non- hydrolyzable drugs w/o	emollients, vehicles for solid, liquid, or non-hydrolyzable drugs o/w	drug vehicles polyethylene glycol
Examples	White Petrolatum, White Ointment	Hydrophilic Petrolatum, Anhydrous Lanolin, Aquabase™, Aquaphor®	Cold Cream type, Hydraous Lanolin, Rose Water Ointment, Hydrocream™	Hydrophilic Ointment, Dermabase™, Velvachol®, Unibase®	PEG Ointment, Polybase™

Aquabase
Aquaphor) Absorption ointment base

Rose water ointment
hydrocream) w/oil emulsion
ointment base

Dermabase
velvachol) o/water emulsion
unibase ointment base

PEG ointment
polybase) water miscible
ointment base