

**Semi-solid
pharmaceutical dosage
forms**

Introduction

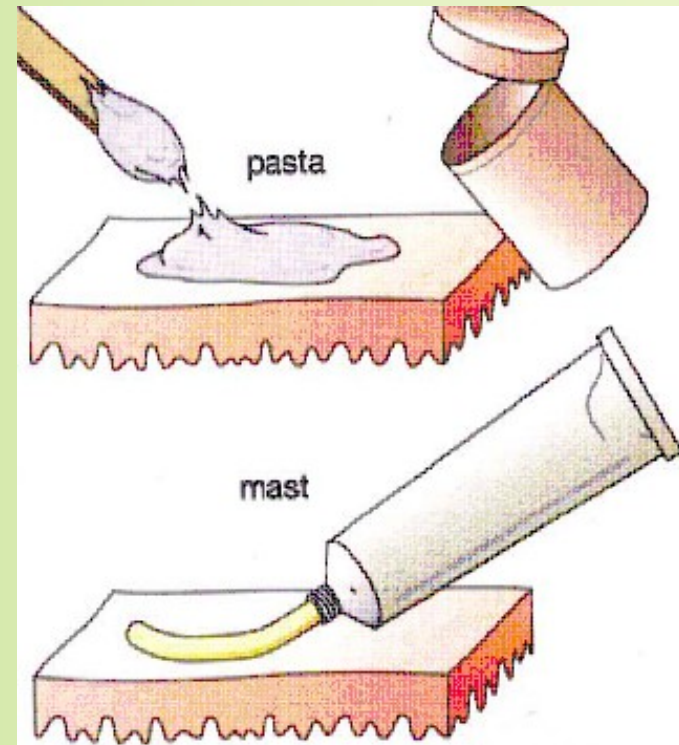
- At normal temperature can be plastically deformed
- At the body temperature they turn soft
- Typical adjuvants – emulgators, tensides
- For topic application

Drug can be dispersed

- **dissolved** (oily drug in oily base, water soluble drugs in hydrophilic base)
- **suspended**
- **emulsified** - two-stage system - **w/o** or **o/w**
- **suspended in emulsion**

Examples

- **Ointments - Unguenta**
- **Eye ointments**
(Unguenta ophtalmica)
- **Creams - Cremores**
- **Pastes - Pastae**
- **Transdermal plasters**
(Emplastra transcutanea)
- **Liniments – (Linimenta)**



Ointments

- topical, semi-solid preparations, non-specific in shape, destined for application on skin or mucosas
- melt at body temperature
- Suitable for chronic treatment
 - penetrate the skin slowly but deep



Types of ointments - oleophilic

- **Oleophilic** (hydrophobic) ointments
 - Compatible with majority of the drugs
 - Bases are hydrocarbons, waxes or triacylglycerols

Bases:

- White vaseline – **Vaselineum album**;
- Yellow vaseline – **Vaselineum flavum**;
- Pork lard – **Adeps suillus**;
- White bee wax – **Cera alba**;
- Solid paraffine – **Paraffinum solidum**,
- Liquid paraffine – **Paraffinum liquidum**.
- Cacao oil – **Cacao oleum**
- vegetable oils (**olive, sunflower, peanut, coconut, almond**)

Types of ointments - oleophilic

- Cannot be washed away by water
- They macerate the skin (stop skin perspiration, but the penetration of the drug is better)
- Are more difficult to spread on the skin (better when partially melted)
- Protective and softening effects

Types of ointments - hydrophilic

- **Hydrophilic (oleophobic) ointments**
 - Miscible with water
 - Washable, suitable for application on hairy skin
 - base
 - mixture of liquid and solid macrogols (polyethylene glycols)
 - **macrogolum 300-1500** (molecular weight)

Types of ointments - hydrophilic

- desiccative (cleaning) effects
- may react with some drugs (sulfonamides, salicylic acid, tannins)
- macrogol base is bactericidal on its own

Emulsifying ointments - RM bases

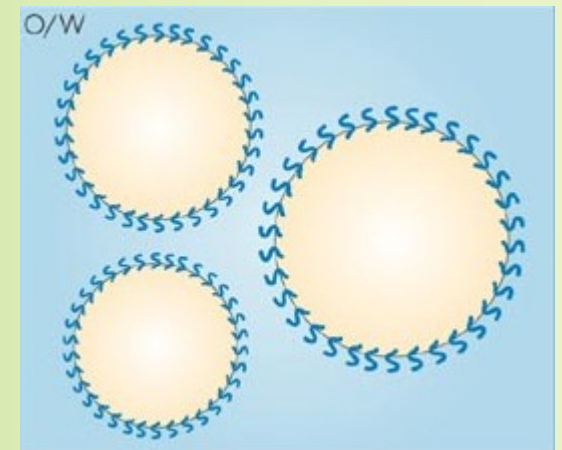
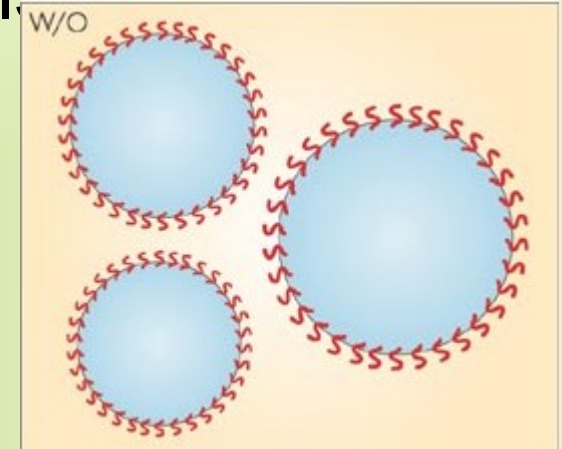
An emulsifier (also known as an emulgent) is a substance which stabilizes an emulsion by increasing its kinetic stability.

Emulsifier w/o:

- Synderman
- Cutilan
- Ambiderman

Emulsifier o/w:

- Neo-Aquasorb/Aquasorb



Pharmacopoea - ointments

- Unguentum simplex
- Acidi borici unguentum 10%
- Ichtamoli unguentum
- Zinci oxidi unguentum
- Unguentum ophtalmicum simplex (sterile emulsifying base)

Usual amount prescribed

- Eye, nose, ear 10-20g
- Face, hands 20-30g
- Legs 80-100g
- Larger surface 150-200g

Example

Rp.

Acidi borici 5.0

Vaselini albi ad 50.0

M.f.ung.

D.S. 3 times a day apply on focus

Ocular ointments (Unguenta ophthalmica)

- Gently made unguents, sterile base, non-irritating
- For application into conjunctival sac
- Today mostly RMP
- Base: Unguentum ophthalmicum simplex (white vaseline, Adeps lanae, liquid paraffine)

- Always sterile!!!
- Subscriptio: „*Misce fiat unguentum ophthalmicum*“ – „*M. f. ung. oph.*“

Example: 2% miotic unguent with pilocarpine

Example

2% miotic unguent with pilocarpine

Rp.

Pilocarpini hydrochloridi 0.2

Unguenti ophtalmici simplicis ad 10.0

M.f.ung oph.

D. ad ollam

Adde bacillum!

D.S. Eye ointment, apply at night to both eyes.

Creams

- Two-phase base
- 15 % of water at least, easier to apply (lower density)
- Lipophilic creams (w/o)
 - Similar to physiologic skin film – often prescribed
 - Oily creams
- Hydrophilic creams (o/w)
 - 50-90 % of water
 - Cooling, may be dessicative
 - Light, not very oily creams

Pharmacopoea - creams

- Cremor refrigerans – cooling cream (hydrophilic)
- Alcohololum adipis lanae cremor
- Usually RMP

Suspension ointments - Pastae

- High density (suspension)
- Apart from ointment base and drugs contain 25-50 % suspended solid particles (dust) (starch, ZnO)
- Do not melt, topic use
- Do not prevent perspiration
- Oleophilic / hydrophilic

Pharmacopoea – suspension ointments

- Zinci oxidi pasta
- Zinci oxidi pasta mollis

- Example: 50g of paste with 5 % coal tar

Example

50g of paste with 5 % coal tar

Rp.

Lithantracis picis 2.5

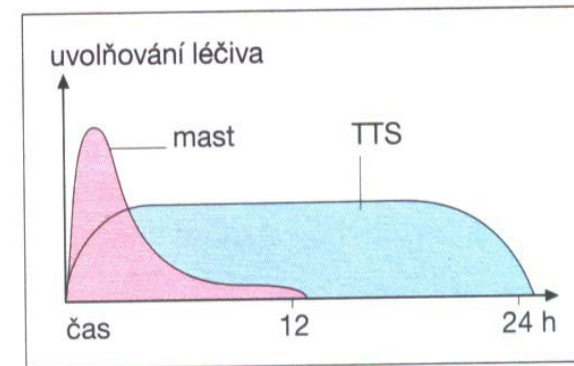
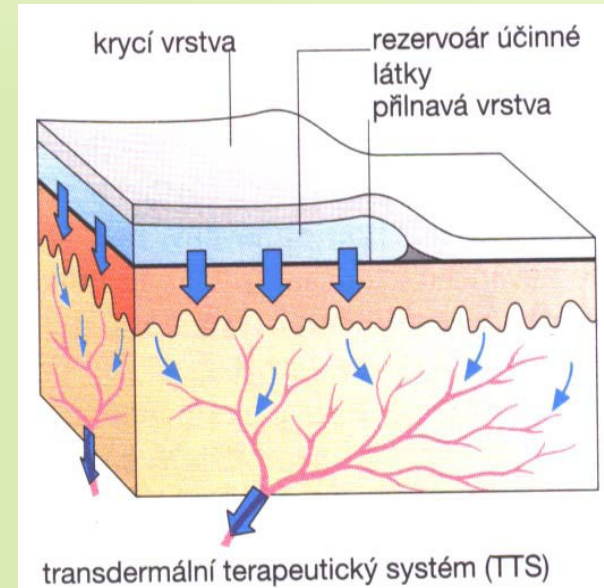
Zinci oxidi pastae ad 50.0

M.f.pasta

D.S. ...

Transdermal plasters

- Modern form
- Only RMP
- Penetration through skin and into blood flow = TTS (transdermal therapeutic system)
- Slow release of drug
- Longer intervals of applications, compliance
- To avoid first-pass effect
- Intake of the drug can be easily stopped



Transdermal plasters

- Enhancers – enhance penetration
 - Hydratation, influence on skin lipids
 - Urea, alcohols

- Never cut into smaller parts!!!



Transdermal plasters

- Only some drugs
 - Estradiol, norelgestromin (Evra) and other hormones
 - Fentanyl (Durogesic)
 - Nicotine (Nicorette, Niquitin)

