King Abdulaziz university
Pharmacy school
Department of pharmaceutics

Cosmetics formulation preparation

Section 1

Cleansing and cold cream

- A characteristic feature of true cold creams is the presence of a relatively large amount of water loosely held in w/o mixture. But, the final product would be unacceptable by modern standards due to instability, poor appearance and reproducibility.
- Inclusion of Borax in formulations produce a more stable product as it reacts with free fatty acids in beeswax to form sodium soap.
- Another important ingredient in formulation is the mineral oil which aids in inhibition of rancidity and improve the stability and whiteness of final product.
- Most cold cream contains these ingredients in different percentage according to the user preference; Borax, beeswax, and mineral oil.
- The main function of cleansing creams is to remove oil soluble and water soluble soil efficiently. While cold creams act as emollient and produce a cooling sensation.

Types of formula:

1. Oil- continuous solid cream with high oil content.
2. Water - continuous solid cream with high oil content.
3. Water - continuous liquid cream with low oil content.
4. Water- continuous liquid cream with medium oil content.
5. Oil- continuous liquid cream with medium oil content.

- Factors that influence the type of emulsion ‘’creams’’ are: ratio of oil to water in the cream, proportion of the beeswax which is saponified, constituents of the cream ‘HLB’’ and temperature.

Prepared by: Bayan Eshmawi

Rx

Beeswax	16.67
Mineral oil	50
Borax	0.83
Water	32.50

Send 20 gram ...

Rx

Mineral Oil	45
Bees wax	16
Triethanolamine	1
Deionized water	q.s

Send 50g ….

H.W

1/ structurally, how borax stabilizes wax?

2/ list three different cream system from commercially available products.

3/ describe how temperature affect the emulsion type?

Support your answer with a scientific paper…

Cosmetics formulation preparation

Section 2

Shaving products

- Men related cosmeceuticals.
- Effective shave is dependent on the following:

1) Preparation of the beard.

2) Application of good shaving aid.

3) Sharpness of blade.

4) Angle of incidence of blade to hair.

5) Pressure exerted on the razor.

- Shaving preparation include those product that used before, during and after hair removal process.
  A-Pre-shave preparation:
  Include bread softening cream, pre-electrical shave preparation.

  B- Shaving cream:
  Include shaving cream soap or lather shaving cream and brushless or non lathering creams.

  C- After shaving products:
  Include clear lotion, after shave gel, balm and powder.

Shaving cream soap

Rx	w/w %
Stearic acid	35
Coconut oil	9
KOH (50%)	3.75
NaOH (100%)	1.5
Glycerol	10
Water	36.5
KOH (50%)	3.75
Perfume	0.75

Send 20 gm .....

Brushless ‘’non-lathering cream’’

Rx

Stearic acid		22g
Liquid paraffin		3g
NaOH		0.2g
Borax		0.5g
Lanolin		3.6g
Water	ad	100g

Send 25g…..

H.W

1) From previously formulated prescriptions, list the function of each ingredients?
2) Give an example of commercially available shaving products..

Cosmetics formulation preparation

Section 3

Shampoos and conditioners

- Formulation of shampoo should balance between cleaning and leaving hair in a good condition.
- Considering the type of hair is important in formulation tailoring. Ex: people with greasy hair need a shampoo's effect that last longer while people with dry hair need an oily based formulation content to protect their hair.
- Detergent effect of shampoo mainly based on the removal of greasy layer on hair then removing the dirt attached.
- Mechanism of detergency:
  1- Wetting of dirt and keratin layer on hair by lowering surface tension
  2- Displacement of dirt by detergent solution
  3- Dispersion of dirt particle to be washed away
- Raw materials of shampoo are :
  - Principle surfactants ➔ to provide detergency and foam
  - Secondary surfactants➔to improve detergency, foam and hair condition
  - Additives➔ to complete the formulation (e.g.: color, perfume ...etc)
- Principle surfactants are divided in 4 categories: Nonionic, cationic, anionic and ampholytics. Among these anionic and ampholytics are considered the most commonly used ones because of their excellent foaming and conditioning properties.

Examples: fatty acid soaps, paraffin sulphonates, Alkyl benzene sulphonates, alkyl sulphates*, Alkyl ether sulphates

- Secondary surfactants examples are secondry alkyl sulphate, monoglyceride sulphate, turkey red oil, alkyl phosphates, alkyl sulphosuccinates, isothionates, methyl taurides, fatty acid alkaolamides, acyl amino acides, acyl sarcosines, acyl peptides
- Additives are grouped in Germicides, conditioning agents, pearlescent agents, sequestrants, colors, perfumes and preservatives.

Types of formula:

1- Clear liquid shampoos
2- Liquid cream shampoos
3- Solid cream and gel shampoos
4- Anti-dandruff and medicated shampoos
5- Oil shampoos
6- Powder shampoos
7- Aerosol shampoos
8- Dry shampoos

- Dermatological safety of shampoo is extremely important. Hence, evaluation of surface activity, pH, wetting and foaming power are essential for shampoos and conditioners.

Rx:

Shampoo pastes

Na lauryl sulphate	450 g
Cetyl Alcohol	50g
Distilled water	500g

Send 25 gram ...

Ingredient uses:

Na lauryl sulphate is the main detergent.

Cetyl Alcohol improves formulation viscosity.

Rx:

Conditioner

Na lauryl sulphate	5 g
Citric Acid	20 g
Cetyl Alcohol	150g
Distilled water	825g
Perfume	0.3%
Methyl Paraben	0.15%

Send 20g ….

Ingredient uses:

Na lauryl sulphate is the main detergent.

Cetyl Alcohol improves formulation viscosity.

Citric acid used to adjust pH and improve formulation smell.

H.W

1/ How to evaluate detergency of shampoo?

2/ give an example for each group of additives that used in shampoo formulations.

3/ How to evaluate wetting and foaming power of the formulation?

Cosmetics formulation preparation

Section 4

Make-Up products

Face powder & Lipsticks

- Face powder is a cosmetic powder applied to the face to set a foundation after application. It can also be reapplied throughout the day to minimize shininess caused by oily skin.
- There are two type of face powder: translucent sheer powder, and pigmented powder.
- Certain types of pigmented facial powders are meant be worn alone with no base foundation.
- Powder tones the face and gives an even appearance.
- Also, some powders with sunscreen can also reduce skin damage from sunlight and environmental stress.
- Face powder comes packaged either as a compact or as loose powder. It can be applied with a sponge, brush, or powder puff. Uniform distribution over the face is achieved more easily when a loose powder is applied.
- Because of the wide variation among human skin tones, there is a corresponding variety of colors of face powder
- Covering power of face powder is its ability to conceal various defect of facial skin including scars, blemishes, enlarged pores and excessive shine.
- Main ingredients that facilitate covering powers are: Titanium Dioxide, zinc oxide, Kaolin, magnesium oxide.
- For maximum coverage, formulators need to consider the surrounding medium for these ingredients '' refractive index changes when it's in water or in petroleum'' and the particle size
- Adhesion characteristics of face powder is imparted by talc, metallic (Zn, Mg) stearate, emollients (cetyl, stearyl alcohols, and glyceryl monostearate), petroleum jelly.
- The quality of spreading of face powder and production of smooth feeling ''slip'' are mainly due to talc and stearates.

- Sometimes ingredients like rice starch, silica, partially hydrolysable powdered silk are included to give a peach like finish of the face powder.
- Powders usually get colored with pigments' 'mainly insoluble'' or pearlescent pigments like guanine and bismuth oxychloride.
- Face powders are classified into light ''loose'', medium, and heavy according to the covering power rather than the density.
- Compact face powder has same materials used in loose powder plus the binding agents which makes it very useful in application as well as in storage.
- Binding agents are classified as dry metallic stearate, oily, synthetic water soluble as CMC, water insoluble or water repellent as paraffin wax, and water in oil emulsion as glyceryl monostearate.

Lipsticks

- Lipstick is a lip cosmetics molded into sticks.
- It is essentially a dispersion of coloring matter in a base consisting of a suitable blend of oils, fats and waxes.
- A good lipstick should:

1. Have an attractive appearance
2. Be innocuous, both dermatologically and if ingested
3. Be easy to apply

- Lipstick ingredients are coloring material and base
- Typical proportion for the color in lipstick are as follows:

	Per cent.
Staining dyes	2-3
Oil soluble pigment	2
Insoluble pigment	8-10
Titanium dioxide	1

- Base is an important factor in lipstick quality during manufacture, storage and use.
- Base is formed by a mixture of oils, fat and wax.
- Examples of liquid base ingredients are: castor oil, silicon fluid, mineral oil , liquid lanolin, PEG…etc
- Examples of solid base ingredients are: waxes ''beeswax'', microcrystalline wax as ozokerities and ceresine
- Example of Other additives:
  Preservative, antioxidant, U.V filters perfumes and flavor.

Rx:

Light ''loose face powder''

Zinc stearate	70g
Zinc oxide	100g
Light $CaCO_3$	200G
Talc	630g

Send 25 gram ...

Rx:

Heavy type face powder

Mg stearate	50g
Zinc Oxide	150 g
Light $CaCO_3$	400g
Talc	200g
Pigment	q.s

Send 25g ....

Rx:

Lipstick	% w/w
Beeswax	25g
Lanolin	5g
Cetyl alcohol	5g
Castor oil	65g
Pigment	q.s
Perfume	q.s

Send 25g ....

H.W

List some coloring agents used in cosmetic preparation and categorize it as soluble and insoluble ''pigment''...