

4<sup>th</sup> Club



Club Founder  
**Dr. Mahmoud Bahgat**



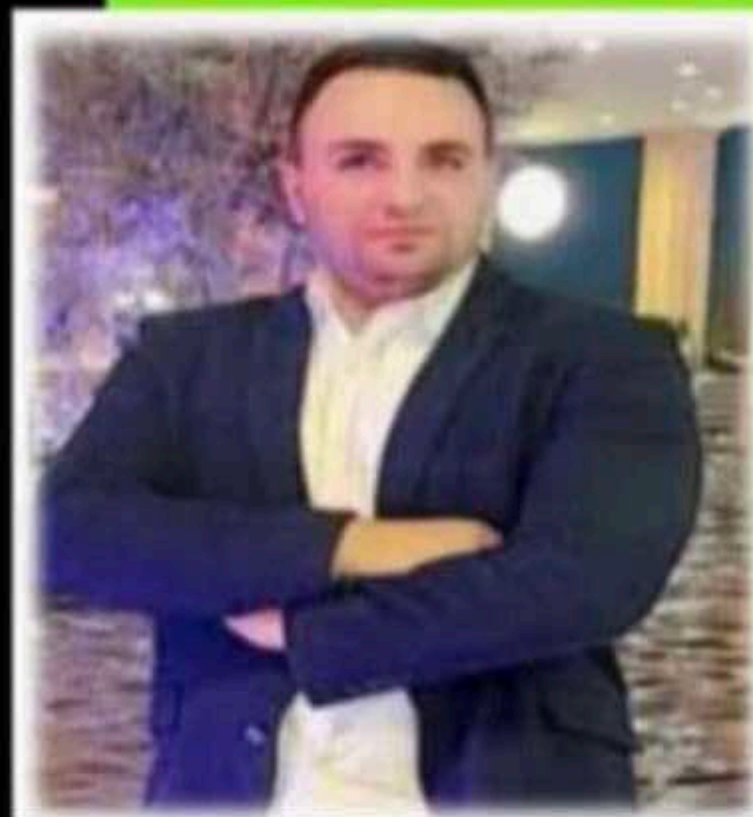
**International Pharmacists Club**

**Pharmacist as a Cosmetic Formulator**

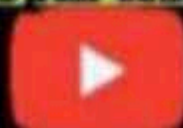
**الصيادلة كخبير في التركيبات التجميلية**

**Monday 24<sup>th</sup> Feb 2025**

**9pm EGY 10pm KSA 11pm UAE**



**Dr. Sabry Khalil**  
**Cosmetic Formulator Expert**





# How to be Cosmetic Formulator?

كثير جدا منّا أنعرض علينا تركيبات وحس أنّها جامده جدا  
لكن ف علم يقول ان التركيبات دي مش صح

ازى انت ك صيدلي؟

في مصنع او صاحب شركة او عايز تعمل منتج؟

تقدر تحكم ع التركيبة المعروضة عليك؟

وكمان ازي تكون صيدلي تجميل ف صيدليات كبيره؟

واذاي يبقى عندك اساسيات التجميل وتوظف المنتجات من  
تركيبها في الاعراض الصحيحة المناسبة ليها؟

علم الكوزميتك يعتمد على كل ال درسناه ف كلية الصيدلة

لك انا بعتبر الصيدلي اكثر حد يبقي مميز ف المجال دة

درس علم الأعشاب والتركيبات والتدخلات الدوائية





Vocabulary of Cosmetic Science Here is a basic 'vocabulary' of terminology you will see throughout your study with us.

**Amphoteric** substance;  
can be positively or negatively charged,  
depending on the pH environment.  
In cosmetic science,  
amphoteric substances are usually positively charged in  
an acidic pH ( $\text{pH} < 7$ ).  
and negatively charged in an alkaline pH ( $\text{pH} > 7$ ).





**Anhydrous:** without water. For example, powders and oils are completely anhydrous, as they do not contain any water

**Anionic:** negatively charged. An anionic substance is always negatively charged whether it be a gum, emulsifier or surfactant. Anionic substances are not usually compatible with cationic substances, although exceptions do occur. Anionic substances are typically used in face and body care in lotions and creams. Anionic surfactants are very effective cleansing agents for the body and hair but should not be used in conditioning products, which usually carry a cationic (positive) charge.

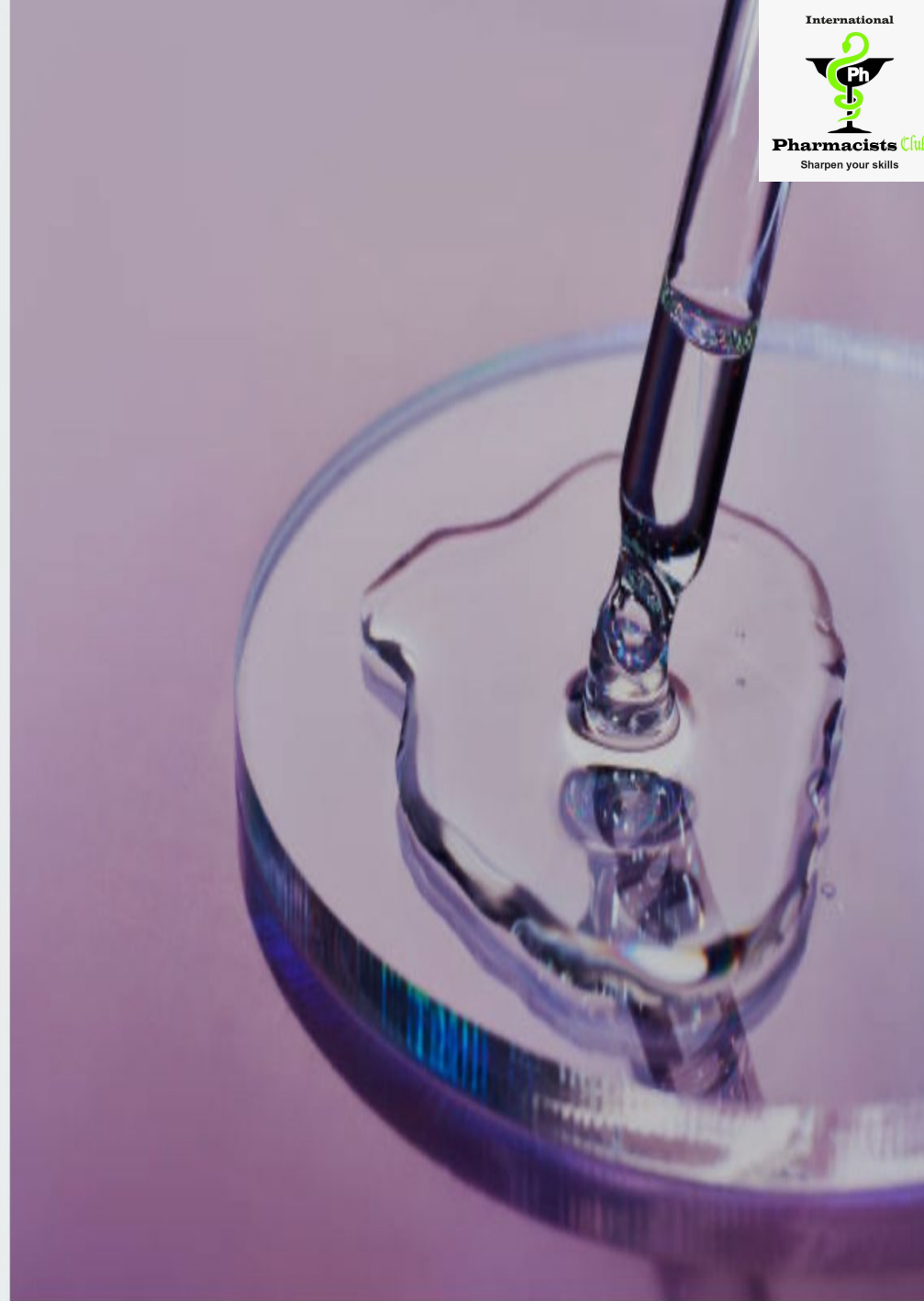
**Antioxidant:** a substance that acts to slow or prevent oxidation. It is not a preservative although can contribute to prolonged shelf life by slowing or preventing oxidation of natural oils, essential oils and other oxidative-prone substances.

**Absorption:** where a product is taken in through the pores of the skin.

**Adsorption:** the adhesion of a substance on the surface of another material.

**Cationic:** positively charged. A cationic substance is always positively charged whether it be a gum, emulsifier or surfactant. Cationic substances are not usually compatible with anionic substances, although exceptions do occur. Cationic substances are usually used in hair conditioners as they make the hair feel slippery.

**Emulsifier:** a chemical used to form an emulsion and/or help stabilise an emulsion from separating. Note: in Cosmetic Chemistry, 'emulsifier' is used to describe a surfactant substance that specifically forms creams/lotions rather than a foaming product.







**sterification**: the formation of an ester through reaction of acid and alcohol functional groups in chemicals. Esters are commonly emollient lipids (oil like substance) but may also be emulsifiers.

► **emulsion**: a suspension of droplets within a continuous phase; for example, an oil in water (o/w) emulsion is common in the personal care industry where oil droplets are suspended throughout a continuous phase. Since water is the continuous phase, this type of product would be water compatible (dispersible), would require hydrophilic emulsifiers and gums/polymers (water loving - see below) and would tend to feel non-greasy on the skin. Water in oil (w/o) emulsion means water droplets are suspended throughout an oil continuous phase. Since oil/lipid is the continuous phase, this type of product would not be water dispersible, requires specific emulsifiers and gums/polymers that suit an oil/lipid continuous phase and could feel greasy on the skin unless esters, mineral oils or silicones are used. Emulsion products, both o/w and w/o, look white and milky, like a lotion or cream.





- ▶ **Ethoxylation**: treatment or reaction with ethylene oxide. This is done to make a substance more hydrophilic (water loving). GMP: Good Manufacturing Practice. A set of rules that govern how cosmetic products should be made so as to ensure finished products contain their specified quantity and type of ingredients and meet quality requirements, without human, microbial or cross-contamination with non-specified inputs.
- ▶ **Hydrogenation**: the reaction of hydrogen with another substance, usually under pressure and high temperatures in the presence of a catalyst. Oils are commonly hydrogenated to make them more butter-like. Hydrolysis: a chemical reaction whereby a water molecule is added to a substance resulting in the split of that substance into two parts.







- ▶ **Hydrophilic:** water loving/compatible with water. These substances are lipophobic; not compatible with oil. Lipid: an oil like substance, can include oils, fats, waxes, mineral oil, esters and silicones. To be classified as a lipid, the substance would be lipophilic. Lipophilic: oil loving/compatible with oil. These substances are hydrophobic; not compatible with water. Non-ionic: no charge. A non-ionic substance never carries a charge and is not affected by charge whether it be a gum, emulsifier or surfactant
- ▶ **Oxidation:** a reaction where the atoms of an element lose electrons and become unstable. In personal care products, oxidation creates discolouration and/or rancid odours to develop in a product and can make a product unsaleable/have a short shelf life.







- ▶ **Petroleum derivatives**: substances that are created by using the hydrocarbon backbone of crude oil. They are highly refined for personal care products and do not resemble the petroleum used to fuel vehicles.
- ▶ **Polymer**: a large molecule that has many repeating sub-units. **Preservative**: a substance that prevents or retards microbial growth in a product. **Propoxylation**: the addition of a propyl functional group to a molecule. **Rancidity**: a change in aroma to display off notes or undesirable characteristics in an oil.
- ▶ **Sequestrants**: a compound that forms chelates (bonds) with metal compounds to prevent metal catalysed oxidation and/or formation of scum in hard water areas.
- ▶ **Shelf life**: the period of time over which suitable performance characteristics of a personal care product are maintained.





- ▶ **Solvent:** a liquid that dissolves a solid or liquid substance.  
**Stability:** a measure of how well a formulation remains suitably unchanged over its shelf life.
- ▶ **Sulphonation/sulfonation:** the addition of a sulfonic acid functional group to a molecule.
- ▶ **Superfatting agent:** a lipid derivative that has been made partially hydrophilic, a superfatting agent is one which can help provide a more emollient/skin conditioning feel to a foaming product with its lipid portion whilst being able to be washed easily from the skin or hair due to its hydrophilic portion.
- ▶ **Surfactant:** a substance with water loving and oil loving portions, making it surface active. Note: in Cosmetic Chemistry, 'Surfactant' is used to describe a surfactant substance that is used to cleanse the hair or body and creates foam. While an emulsifier is chemically speaking a surfactant, the term 'emulsifier' is used in Cosmetic Chemistry to describe substances which create lotions/creams compared to those which foam.



- ▶ **Transesterification**: the reaction of an ester with an alcohol functional group to create a new ester.
- ▶ **Viscosity**: a measure of resistance to flow of a substance, commonly referred to as how readily a product will move when tipped.
- ▶ **%w/v** - ‘% weight per volume’ is a term used to describe how many grams of a substance has been added to make up a certain volume of solution. For example, a 50% w/v solution would contain 50g of solid per 100mL of final solution.
- ▶ **%v/v** - ‘% volume per volume’ is a term used to describe how many milliliters of a liquid has been added to make up a certain volume of solution. For example, a 50% v/v solution would contain 50mL of a certain liquid per 100mL of final solution.





- ▶ Every ingredient used in a cosmetic and personal care product serves a purpose. When a formulator selects ingredients, they are guided by the company philosophy and role of the ingredient within the formulation; based on information obtained from a product development brief. Depending on the company philosophy and type of formula being developed, the choice of ingredients to select from can be wide and varied, as for a product which is driven by performance with a flexible budget; or, as in the case of Certified Organic products, narrowed down to a comparatively small selection based on the certified organic and natural status of the ingredients.



## ► 1.1 Company philosophy

Each company should have their unique story - what makes them different to everyone else.

When considering the company philosophy, it must be remembered that a personal care company can not be thought of as exclusive to their products; because it is their philosophy that drives the development of products with a certain marketing story.

However, since the end product is that which is used by the consumer, it is often the story of the products, or range of products they provide that defines the company philosophy in the mind of the consumer.



► The company philosophy may include one or more of the following approaches:

- price - where a company releases products that compete with others based on price.

The concept here is to present a product that is the best it can be, within the constraints of a strict budget.

Home brand products are an example of a price-driven philosophy.

- using certain ingredients in every product
- where the company releases products based on the addition of certain key ingredients in every product in the range.

For example, this may be a combination of herbal extracts or essential oils with a proprietary blend or name;

or a signature fragrance across a range of products with the same branding.





- ▶ avoiding the use of certain ingredients
  - where the company's product philosophy is based on what the company chooses to avoid in all of their products. For example, it is a popular trend these days to avoid the use of parabens as preservatives.
  - natural or organic branding - a growing trend is for companies to promote their products based on their natural and/or organic content. This can be in part, by the addition of certain herbal extracts or plant oils to an otherwise synthetic product base; in full, by developing a Certified Organic range; or somewhere in between, with a mix of synthetic, natural and/or organic ingredients present.
  - product features - where the philosophy of the company is that the product should have unique, stand out features; such as smell, feel, performance or results. There is usually a budget involved but is more flexible than a company whose products are driven solely by price. Luxurious, elite brands and the companies behind such brands are an example of a philosophy driven by the features of a product.



- ▶ technology and innovation -
- ▶ where the products released by the company represent the latest technological advances. These products also tend to have a higher price tag than others in the market place; and the companies who release such products often strive to be the market leaders by being the first with the 'latest and greatest for example evolving all the time;

consider the launch of skin whitening products several years ago, and more recently, launch of botox-alternative skin care and non-surgical face lift 'kits'.

- ▶ • target market -
- ▶ where the company launches products based on the needs of their target market. No matter what the company philosophy, every product should be promoted to the target market; however some companies will launch a product or range of products based on the 'gaps' within the industry. In this case, product development revolves solely around a target market 'gap' being first identified, and then accommodated for specifically. Examples of this are the emerging men's skin care ranges and the personal care market for young teens



## ► 'me too' products

- where a company releases products simply because they are the most popular trend at the time. 'Me too' products need to compete in a crowded marketplace so often compete on price with other similar products.

Walk along the aisles of just about any supermarket and you will see many examples of 'me too' products; only ever moderately successful or often unsuccessful in the market place because they are just too similar to everything else available and unable to compete on price or market presence compared to the larger brands.





**Product name: BTMS Base Cream**

**Total Amount of product in grams**

**100**

***Phase A***

distilled water

**%**

60.00

**Gram**

**60.00**

***Phase B***

BTMS Emulsifying Conditioner

10.00

**10.00**

cosmetic carrier oil and/or butter

24.00

**24.00**

Silicone Gel

5.00

**5.00**

***Preservatives***

EK300 or EP9010

1

**1.0**

**TOTAL**

**100.0**

Phase A. Heat to 77C / 170F degrees.

Phase B. Heat to 77C / 170F degrees.



Product name: 50kDa and regular weight Hyaluronic acid gel - WITH preservative

Total Amount of product in grams		100					
<b>Phase A</b>		%	Gram				
distilled water		90.00	90.00				
sodium hyaluronate powder		1.00	1.00				
50kDa sodium hyaluronate powder		4.00	1.00				
<b>Phase B</b>		%	Gram				
Propanediol		6	1.0				
EP9010		1	1.0				
<b>TOTAL</b>		<b>12.00</b>	<b>4.00</b>				

Phase A. Spinkle 50kDa sodium hyaluronate powder on water, mix well until all powder is dissolved.

Phase B: Spinkle sodium hyaluronate powder on water, mix well until all powder is dissolved and a gel has formed.

Phase C: Dissolve EP9010 in propanediol, mix well at high speed.

Phase D: Combine Phase A and B, mix well at high speed



### AHA-Treatment Toner - 1270

Ingredient	Function	Percent	Wgt (g)	Wgt (oz)	Vol (tsp.)
<b>Phase A</b>					
Distilled Water (aqua)	Diluent	47.70	47.70	1.68	9.54
Xanthan Gum, Prehydrated (xanthan gum)	Thickener	0.30	0.30	null	null
Lactic Acid (lactic acid)	Exfoliant	1.50	1.50	0.05	0.30
Glycolic Acid (glycolic acid)	Exfoliant	1.50	1.50	0.05	0.30
Polysorbate 20 (polysorbate 20)	Solubilizer	1.00	1.00	null	null
Neroli Hydrosol - Neroli Distillate Certified Organic Neroli Distillate	Diluent	30.00	30.00	1.06	6.00
<b>Phase B</b>					
Mallow Extract (glycerin, water, Malva sylvestris [Mallow] extract)	Botanical	5.00	5.00	null	null
Chamomile Extract (glycerin, water, Chamomille Recutita [matricaria] flower extract)	Botanical	3.00	3.00	null	null
Natural Bisabolol (bisabolol)	Anti-oxidant	0.50	0.50	0.02	0.10
Aloe Vera Pure Juice (aloe barbadensis)	Botanical	8.00	8.00	0.28	1.60
<b>Phase C</b>					
Caprylyl Glycol EHG (caprylyl glycol, ethylhexylglycerin)	Anti-Microbial	1.00	1.00	null	null
Triethanolamine (triethanolamine)	pH Adjuster	0.50	0.50	0.02	0.10

#### Method

Blend phase A ingredients. Mixing the xanthan gum well until smooth. Add phase B and blend well. Add phase C, blend well. Adjust the pH to 3.5 by adding triethanolamine (TEA), increase amount if necessary.

#### Properties

A gentle but effective AHA exfoliating Toner packed with botanicals. Glycolic and lactic acid, moisturize but also exfoliate the skin revealing a more vibrant, refreshed, and healthy-looking complexion. Use after removing makeup, before applying night cream. This product contains an alpha hydroxy acid (AHA) that may increase your skin's sensitivity to the sun and particularly the possibility of sunburn. Use a broad spectrum SPF 30 sunscreen, and limit sun exposure while using this product and for a week afterwards.



## Product Name: Moisturising Body Lotion

Phase	% w/w	Trade Name
A	77.8	Water
B	5.0	Glycerin
B	0.4	Xanthan gum
C	0.5	Glyceryl Stearate Citrate
C	4.0	Olivem 1000 (Cetearyl Olivatate, Sorbitan Olivatate)
C	2.5	Avocado oil
C	2.5	Almond oil
C	5.0	Caprylic/capric triglycerides
D	0.8	Essential oil blend
D	0.5	Vitamin E
D	1.0	Phenoxyethanol, Ethylhexylglycerin (Euxyl PE9010)
		<i>(you could add extracts and actives here but take this off the water input at the start to make sure your formula totals 100%)</i>
	q.s	pH adjuster
	100.0%	Total

METHOD	1. Measure out phase A.
	2. Combine phase B to form a slurry.
	3. Add phase B to phase A while stirring until fully hydrated and a gel forms. Heat to 75°C.
	4. Combine phase C and heat to 75°C.
	5. Add phase C to phase A/B and stir until a glossy, homogenous emulsion forms.
	6. Continue stirring while product cools. At 40°C, add phase D ingredients and stir until homogenous.
	7. Check/adjust pH at 25°C.
	Final pH required: 5.3 – 5.8

### Notes on this formula:

- Remember, your emulsion will set to a different viscosity the day after you make it – so evaluate it the next day as it will be a lower viscosity on the day you make it.
- Keep practicing adding your phases at the right temperature to ensure a glossy, milky looking emulsion forms without evaporation – practice makes perfect!
- Our formulas have added notes at the end about adding extracts, vitamins or actives – keep all additions to 5% maximum at this stage and remember that some actives can destabilise your formulas. You'll learn why this happens and how to fix it later in your studies with us. For now, focus on good emulsion creation and gaining confidence with your practical samples.







## Product Name: Natural Face Cream

Phase	% w/w	Trade Name
A	74.6	Water
B	5.0	Glycerin
B	0.4	Xanthan gum
C	1.5	Glyceryl Stearate Citrate
C	4.0	Olivem 1000 (Cetearyl Olivatate, Sorbitan Olivatate)
C	5.0	Shea butter
C	2.0	Macadamia oil
C	2.0	Avocado oil
C	2.0	Almond oil
C	1.0	Beeswax
D	0.5	Essential oil blend
D	1.0	Vitamin E
D	1.0	Benzyl Alcohol, Salicylic Acid, Glycerin, Sorbic Acid (Geogard ECT)
		<i>(you could add extracts and actives here but take this off the water input at the start to make sure your formula totals 100%)</i>
	q.s	pH adjuster
	100.0%	Total

METHOD	1. Measure out phase A.
	2. Combine phase B to form a slurry.
	3. Add phase B to phase A while stirring until fully hydrated and a gel forms. Heat to 75°C.
	4. Combine phase C and heat to 75°C.
	5. Add phase C to phase A/B and stir until a glossy, homogenous emulsion forms.
	6. Continue stirring while product cools. At 40°C, add phase D ingredients and stir until homogenous.
	7. Check/adjust pH at 25°C.
	Final pH required: 5.3 – 5.8

### Notes on this formula:

- The more emulsifying waxes, the more viscosity you build to a formula. That is what differentiates a cream from a lotion. The oil content may be similar in both product types but the types of oils also typically change – they are often longer spreading in a lotion and short spreading/more emollient in a cream product.







## Product Name: Sulphate Free Shampoo

Phase	% w/w	Trade Name
A	3.0	Polysorbate 20
A	1.0	Essential oil blend
A	0.3	Vitamin E
B	21.0	Sodium lauroyl sarcosinates (30%)
B	12.0	Cocamidopropyl betaine (30%)
B	2.0	Coco-glucoside (52%)
C	47.5	Water
C	5.0	Polyquaternium-7 (9%)
D	6.0	Glycerine
D	1.2	Xanthan gum
E	1.0	Benzyl Alcohol, Salicylic Acid, Glycerin, Sorbic Acid (Geogard ECT)
		<i>(you could add extracts and actives here, but they MUST be water soluble. If adding here, limit to 5% maximum and take this off the water input to make sure your formula totals 100%)</i>
	q.s	pH adjuster
	100.0%	Total

METHOD	1. Combine phase A materials.
	2. Combine phase B materials.
	3. Add phase A to phase B under slow stirring – be careful not to introduce too much air while stirring.
	4. Add A/B to phase C and stir slowly – be careful not to introduce too much air while stirring.
	5. Combine phase D into a smooth slurry first; then add to phase A/B/C slowly, ensuring the gum hydrates evenly as you are adding the slurry slowly. Keep stirring slow-medium to ensure the gum hydrates evenly but avoid introducing too much air. Stir until the gum is evenly hydrated.
	6. Add phase E and stir through until homogenous.
	7. Adjust final pH.
	Final pH required: 5.5 – 6.0

### Notes on this formula:

- Note the different types of surfactants used and different inputs between the shampoo and body wash – you will learn why and how to select surfactants and their input in the surfactant unit.  
For now, it's more important that you know different surfactants get used for different reasons and practice that all important METHOD!
- You will notice this is also hard to thicken and thickens significantly when that pH is dropped.
- Monitor your stirring to limit the foam you produce – the more bubbles you add while stirring, the longer your product will take to settle!





## Product Name: Natural Serum

Phase	% w/w	Trade Name
A	85.1	Water
B	5.0	Glycerin
B	0.3	Xanthan gum
C	3.0	Olivem 1000 (Cetearyl Olivatate, Sorbitan Olivatate)
C	5.0	Almond oil
D	0.5	Essential oil blend
D	0.2	Vitamin E
D	0.9	Benzyl Alcohol, Salicylic Acid, Glycerin, Sorbic Acid (Geogard ECT)
		<i>(you could add extracts and vitamins here but take this off the water input at the start so that your final formula totals 100%)</i>
	q.s	pH adjuster
	100.0%	Total

METHOD	1. Measure out phase A.
	2. Combine phase B to form a slurry.
	3. Add phase B to phase A while stirring until fully hydrated and a gel forms. Heat to 75°C.
	4. Combine phase C and heat to 75°C.
	5. Add phase C to phase A/B and stir until a glossy, homogenous emulsion forms.
	6. Continue stirring while product cools. At 40°C, add phase D ingredients and stir until homogenous.
	7. Check/adjust pH at 25°C.
	Final pH required: 5.3 – 5.8



# Thanks a lot

## Q & A