6.2 FORMULATION EXAMPLE: ANTI-REDNESS BI-PHASE SERUM WITH GOTU KOLA

6.2 FORMULATION EXAMPLE: ANTI-REDNESS BI-PHASE SERUM WITH GOTU KOLA

In this lesson, we will cover:

1. **Product development questions.**
2. **Formula.**
3. **Instructions.**
4. **Product specifications.**
5. **Application/usage instructions.**

PRODUCT DEVELOPMENT QUESTIONS

Product type:
Bi-phase serum.

Are you formulating to meet a particular standard or certification?
We are using mainly natural ingredients, although some of the active ingredients (eg panthenol) might not be permitted in certifications. Panthenol is often used in natural cosmetics but it is made synthetically. If you wish to adhere to Ecocert/COSMOS standards, you can omit it.

Who is your target audience?
People of all ages who wish to reduce redness on their skin.

What skin type is it for?
It is targeted at skin with visible redness.

What is the purpose/function of your product?
To soothe inflammation and reduce redness.

Above: Chamomile hydrosol

Above: Sodium lactate

Above: Gotu kola

What properties and qualities do you want your product to have?
Liquid two-layer serum, with a very gentle herbal scent and an oil phase that has a strong yellow-orange color.

Packaging type and aesthetics?
Transparent bottle with a lotion pump closure, or a clear glass bottle with a pipette.

Which solvents are you using and why?
Chamomile hydrosol – for its soothing properties.

Which humectants are you using and why?
Sodium lactate and hyaluronic acid LMW, for their deep moisturizing properties.

Which oils are you using and why?
Cetiol Ultimate – a naturally derived, non-polar hydrocarbon which will separate nicely from the water layer; jojoba oil – liquid wax suitable for many skin types and squalane – for its nourishing and repairing properties.

Which active ingredients and/or essential oils are you using and why?
Centella asiatica/gotu kola for its redness-reducing properties; panthenol for its regenerating properties; aloe vera for its soothing and restorative properties and sea buckthorn CO_2 extract for its high Vitamin E and carotenoid content (which will also add an orange color to the oil phase).

Which other ingredients specific to this product type are you using and why?
Salt, to keep the layers separate; and Preservative Eco as the preservative.


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FORMULA

Phase	INCI name	Trade name	Function	w/w%
A	Chamomilla Recutita (Matricaria) Flower Water	Chamomile hydrosol	Solvent	70.8
A	Sodium Lactate	Sodium lactate	Humectant	2.0
A	Glycerin, Aqua, Centella Asiatica Extract	Centella asiatica/gotu kola extract	Active	3.0
A	Panthenol	Panthenol	Active	2.0
A	Sodium Chloride	Salt	Functional	1.0
A	Benzyl Alcohol (and) Salicylic Acid (and) Glycerin (and) Sorbic Acid	Preservative Eco	Preservative	1.0
A	Sodium Hyaluronate	Hyaluronic acid LMW	Humectant	0.5
A	Aloe Barbadensis Leaf Extract	Aloe vera powder 200x	Active, humectant	0.1
B	Undecane (and) Tridecane	Cetiol Ultimate	Emollient	8.0
B	Simmondsia Chinensis (Jojoba) Seed Oil	Jojoba oil	Emollient	6.0
B	Squalane	Squalane	Emollient	4.0
B	Hippophae Rhamnoides Fruit Extract	Sea buckthorn CO_2 extract	Emollient, active, colorant	1.0
B	Bisabolol	Bisabolol	Active	0.5
B	Tocopherol	Vitamin E (95% mixed tocopherols)	Antioxidant	0.1

INSTRUCTIONS

1. Mix together phase A ingredients to form a homogenous mixture. If you are having difficulty dissolving powdered ingredients, you can heat the water phase to up to 40°C to speed up the process.

2. Adjust the pH of phase A to 4.0-4.5. Optional: Record the amount of pH adjuster solution used. Calculate the amount of solid/pure pH adjuster used and amend your formula to include this. See **Lesson 0.5 Testing and adjusting pH**, for more details.

3. Mix together phase B ingredients to form a homogenous mixture.

4. Transfer phases A and B into your packaging of choice. The order you add them does not matter as the phases will eventually settle down and separate again. If you wish you could combine the phases in a beaker first and then pour the mixture into your bottle.

PRODUCT SPECIFICATIONS

Appearance: Bi-phasic: clear base layer with golden orange top layer.

Odor: Earthy floral.

Color: Colorless base, golden orange top layer.

pH (phase A only): 6.77 before adjustments. We adjusted the pH to 4.55 with 1.61% citric acid (50% solution).

APPLICATION/USAGE INSTRUCTIONS

Shake well before using. Apply one pump to the face and gently massage into the skin. The serum can be used in the mornings and in the evenings.

SUMMARY

In this lesson we explored a formulation for an Anti-redness Bi-phase Serum with Gotu Kola, we learned about the ingredients it includes and the manufacturing process.

6.3 FORMULATION EXAMPLE: ANTI-POLLUTION BI-PHASE SERUM

6.3 FORMULATION EXAMPLE: ANTI-POLLUTION BI-PHASE SERUM

In this lesson, we will cover:

1. **Product development questions.**
2. **Formula.**
3. **Instructions.**
4. **Product specifications.**
5. **Application/usage instructions.**

PRODUCT DEVELOPMENT QUESTIONS

Product type:
Bi-phase serum.

Are you formulating to meet a particular standard or certification?
We are using mainly natural ingredients, although some of the active ingredients might not be permitted in certifications. We are using Japanese knotweed extract that does not have Ecocert certification.

Who is your target audience?
People of all ages, especially those living in a polluted urban environment.

What skin type is it for?
It is suitable for all skin types.

What is the purpose/function of your product?
To protect the skin from pollution.

Above: Lemon hydrosol

Above: Hyaluronic acid

Above: Açai oil

What properties and qualities do you want your product to have?
Liquid two-layer serum, with a very gentle herbal scent. The water phase will have a deep green color.

Packaging type and aesthetics?
Transparent bottle with a lotion pump closure, or a clear glass bottle with a pipette.

Which solvents are you using and why?
Lemon hydrosol – for its uplifting scent and astringent properties.

Which humectants are you using and why?
Sodium lactate and hyaluronic acid LMW, for their deep moisturizing properties.

Which oils are you using and why?
Coco caprylate – an ester that will separate nicely from the water layer; prickly pear seed oil – for its protectant and regenerative properties and açai oil – for its antioxidant properties.

Which active ingredients and/or essential oils are you using and why?
Oligogeline (algae extract, mainly polysaccharide carrageenan), because it forms a protective film on the skin; edelweiss for its protective and anti-aging properties; Japanese knotweed extract for it resveratrol (strong antioxidant) content; green tea extract because of antioxidant EGCG; and tocopheryl acetate as another antioxidant.

Which other ingredients specific to this product type are you using and why?
Salt, to keep the layers separate; Geogard Ultra as the preservative; liquid chlorophyll as the colorant for the water phase and rosemary extract as an antioxidant.

ADDITIONAL NOTES ON THE FORMULATION

This formula utilizes two main approaches in fighting pollution – a film-forming ingredient (oligogeline) to create a protective film that minimizes the amount of pollution particles that get to the skin; and antioxidants that fight oxidative stress due to pollution and other environmental factors. The main component of oligogeline is carrageenan, an algae-derived thickener. If you have a hard time finding this specific ingredient, try substituting it with purified carrageenan or other film-forming ingredients (eg gums, hydrolyzed proteins).

FORMULA

Phase	INCI name	Trade name	Function	w/w%
A	Citrus X Limon Fruit Water	Lemon hydrosol	Solvent	69.8
A	Glycerin, Aqua, Leontopodium Alpinum Flower/Leaf Extract	Edelweiss extract	Active	3.0
A	Aqua (and) Chondrus Crispus Extract	Oligogeline	Active	3.0
A	Sodium PCA	Sodium PCA	Humectant	1.0
A	Sodium Hyaluronate	Hyaluronic acid LMW	Humectant	0.5
A	Butylene Glycol, Aqua, Polygonum Cuspidatum Root Extract	Japanese knotweed extract	Active	4.0
A	Camellia Sinensis (Green Tea) Leaf Extract	Green tea extract	Active	0.1
A	Glycerin, Aqua, Chlorophyllin Copper Complex	Liquid chlorophyll	Colorant, active	0.2
A	Sodium Chloride	Salt	Functional	1.0
A	Gluconolactone (and) Sodium Benzoate	Geogard Ultra	Preservative	1.0
A	Potassium Sorbate	Potassium sorbate	Preservative booster	0.2
B	Coco-Caprylate	Coco caprylate	Emollient	7.0
B	Opuntia Ficus Indica Seed Oil	Prickly pear oil	Emollient	5.0
B	Euterpe Oleracea (Acai) Fruit Oil	Acai oil	Emollient	3.0
B	Tocopheryl Acetate	Tocopheryl acetate (Vitamin E)	Antioxidant	1.0
B	Rosmarinus Officinalis (Rosemary) Leaf Extract, Helianthus Annuus (Sunflower) Seed Oil	Rosemary CO_2 extract	Antioxidant	0.2

INSTRUCTIONS

1. Mix together phase A ingredients to form a homogenous mixture. Geogard Ultra takes a long time to dissolve: this process can be sped up by gently heating (up to 40°C) and continually stirring.

2. Adjust the pH of phase A to 4.0-4.5. Optional: Record the amount of pH adjuster solution used. Calculate the amount of solid/pure pH adjuster used and amend your formula to include this. See **Lesson 0.5 Testing and adjusting pH**, for more details.

3. Mix together phase B ingredients to form a homogenous mixture.

4. Transfer phases A and B into your packaging of choice. The order you add them does not matter as the phases will eventually settle down and separate again. If you wish you could combine the phases in a beaker first and then pour the mixture into your bottle.

PRODUCT SPECIFICATIONS

Appearance: Biphasic, separated into two clean layers.

Odor: Sweet, citrus.

Color: Green base layer and golden-yellow top layer.

pH (phase A only): 4.48.

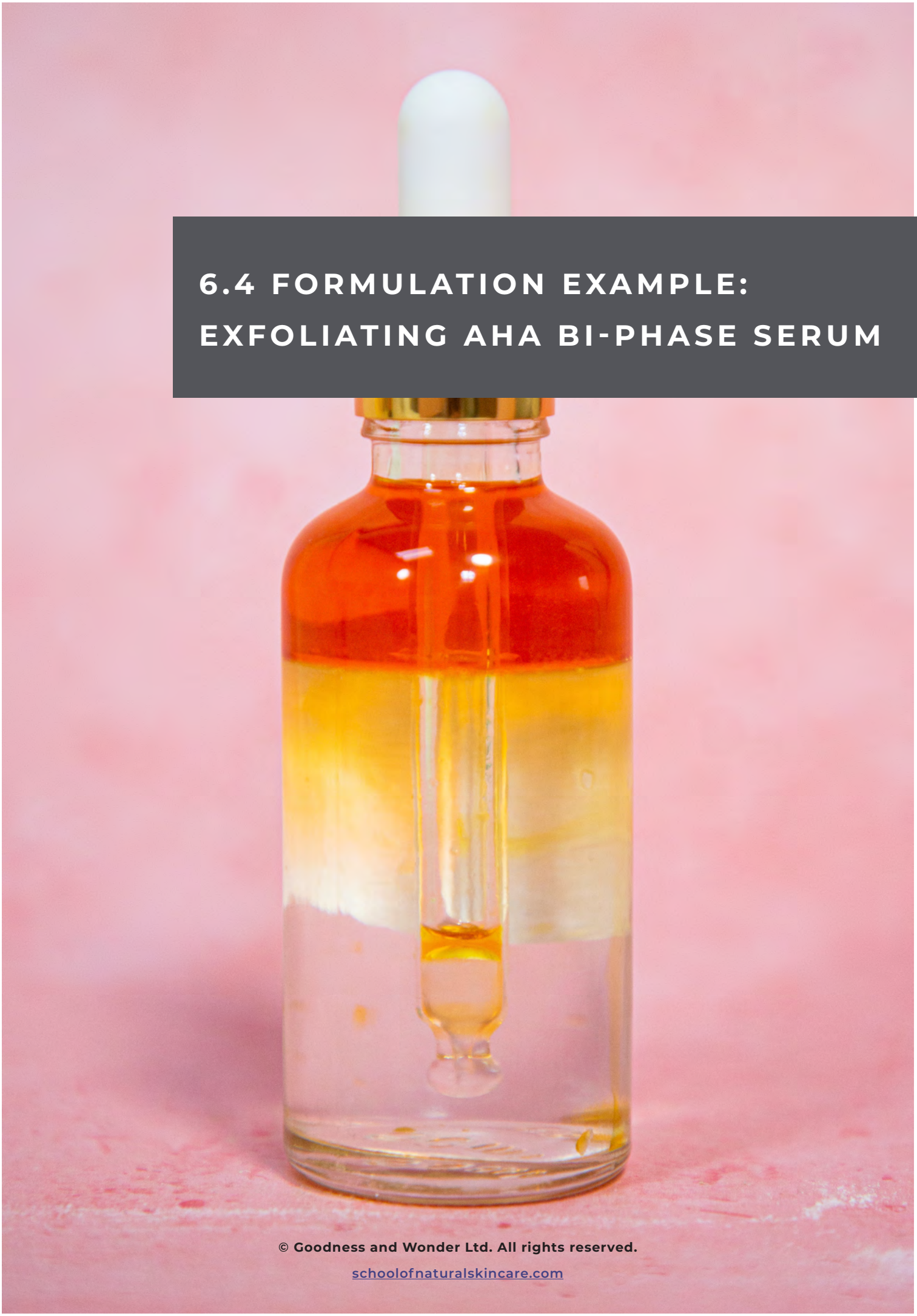
APPLICATION/USAGE INSTRUCTIONS

Shake well before using, apply one pump to the face and gently massage into the skin.
This serum is best used in the mornings.

SUMMARY

In this lesson we explored a formulation for an Anti-pollution Bi-phase Serum, we learned about the ingredients it includes and the manufacturing process.

6.4 FORMULATION EXAMPLE: EXFOLIATING AHA BI-PHASE SERUM



6.4 FORMULATION EXAMPLE: EXFOLIATING AHA BI-PHASE SERUM

In this lesson, we will cover:

1. **Product development questions.**
2. **Formula.**
3. **Instructions.**
4. **Product specifications.**
5. **Application/usage instructions.**

PRODUCT DEVELOPMENT QUESTIONS

Product type:
Bi-phase serum.

Are you formulating to meet a particular standard or certification?
We are using mainly natural ingredients, although some of the active ingredients (eg panthenol and coenzyme Q10) might not be permitted in certifications. Panthenol is often used in natural cosmetics as it exists in nature, but the ingredient is made synthetically. If you wish to adhere to Ecocert/COSMOS standards, you can omit it.

Who is your target audience?
People of all ages who wish to use a chemical exfoliator.

What skin type is it for?
It is suitable for all skin types, but it might be irritating (due to its acidic pH) for sensitive skin.

Above: Lavender hydrosol

Above: ACB Fruit Mix

Above: Panthenol

What is the purpose/function of your product?
To exfoliate dead skin cells, increase cell turnover rate and hydrate the skin.

What properties and qualities do you want your product to have?
Liquid two-layer serum, with a sweet fruity scent.

Packaging type and aesthetics?
Transparent bottle with a lotion pump closure, or a clear glass bottle with a pipette.

Which solvents are you using and why?
Water, and lavender hydrosol – for its soothing and anti-irritating properties.

Which humectants are you using and why?
Glycerin as it is easy to find.

Which oils are you using and why?
Squalane – nourishing and restorative; jojoba oil – a light feeling liquid wax suitable for all skin types.

Which active ingredients and/or essential oils are you using and why?
ACB Fruit Mix (AHA complex) for the exfoliation; panthenol – to help regenerate skin after stress due to acids and coenzyme Q10 – an antioxidant to help regenerate and rejuvenate the skin.

Which other ingredients specific to this product type are you using and why?
Salt, to keep the layers separate; Geogard Ultra as the preservative; Vitamin E as an antioxidant.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ADDITIONAL NOTES ON THE FORMULATION

ACB Fruit Mix is a commercial AHA blend that contains approximately 50% AHAs. Similar blends may be sold under different trade names. If you cannot find a similar AHA blend, you can make your own AHA blend (choose from glycolic acid, lactic acid and malic acid), or use a single acid. Either way, keep the content of the acid at 5%.

FORMULA

Phase	INCI name	Trade name	Function	w/w%
A	Aqua	Purified water (deionized)	Solvent	50.0
A	Lavandula Angustifolia (Lavender) Flower Water	Lavender hydrosol	Solvent	21.0
A	Glycerin	Glycerin	Humectant	2.0
A	Aqua (and) Vaccinium Myrtillus Fruit Extract (and) Saccharum Officinarum Extract (and) Citrus Aurantium Dulcis Fruit Extract (and) Citrus Limon Fruit Extract (and) Acer Saccharum Extract	ACB Fruit Mix	Exfoliant	10.0
A	Panthenol	Panthenol	Active	2.0
A	Sodium Chloride	Salt	Functional	1.0
A	Gluconolactone (and) Sodium Benzoate	Geogard Ultra	Preservative	1.0
B	Squalane	Squalane	Emollient	7.0
B	Simmondsia Chinensis (Jojoba) Seed Oil	Jojoba oil	Emollient	5.0
B	Ubiquinone	Coenzyme Q10	Antioxidant	0.3
B	Citrus Sinensis Dulcis (Orange) Fruit Oil	Sweet orange essential oil	Fragrance	0.5
B	Tocopherol	Vitamin E (95% mixed tocopherols)	Antioxidant	0.2

INSTRUCTIONS

1. Mix together phase A ingredients to form a homogenous mixture. Geogard Ultra takes a long time to dissolve, this process can be sped up by gently heating (up to 40°C) and continuous stirring.

2. Adjust the pH of phase A to 3.5. Optional: Record the amount of pH adjuster solution used. Calculate the amount of solid/pure pH adjuster used and amend your formula to include this. See **Lesson 0.5 Testing and adjusting pH**, for more details.

3. Mix together phase B ingredients to form a homogenous mixture.

4. Transfer phases A and B into your packaging of choice. The order you add them does not matter as the phases will eventually settle down and separate again. If you wish you could combine the phases in a beaker first and then pour the mixture into your bottle.

PRODUCT SPECIFICATIONS

Appearance: Two clearly separated low viscosity phases.

Odor: Sweet, fruity/citrus.

Color: Clear, colorless base layer; orange top layer.

pH (phase A only): 3.57 before adjustments. We adjusted the pH to 3.44 by adding 0.4% citric acid (50% solution).

APPLICATION/USAGE INSTRUCTIONS

Shake well before using, apply one pump to the face and gently massage into the skin. Use once a week, preferably in the evening.

It is essential to use good quality broad-spectrum sunscreen if using AHAs as a part of your skincare routine. Apply sunscreen every morning.

SUMMARY

In this lesson we explored a formulation for an Exfoliating AHA Bi-phase Serum, we learned about the ingredients it includes and the manufacturing process.

6.5 TROUBLESHOOTING BI-PHASE SERUMS

6.5 TROUBLESHOOTING BI-PHASE SERUMS

In this lesson, we will cover:

1. Common problems you may encounter when making a bi-phase serum and how to solve them.

COMMON PROBLEMS YOU MAY ENCOUNTER WHEN MAKING A BI-PHASE SERUM AND HOW TO SOLVE THEM

THE OIL PHASE IS FLOATING ON THE TOP, CAN I REVERSE THE PHASES?

Which phase is going to be on the top and which one on the bottom depends on the density of the phases. Density describes how much a volumetric unit of a material weighs and is usually expressed in kg/m^3 or g/ml. The phase with lower density will float on the top of the phase with higher density. Carrier oils (and most esters as well) have a lower density than water, which means the oil phase will be on the top of a bi-phase serum.

MY PHASES HAVE MIXED A LITTLE; THERE ARE DROPLETS OF ONE PHASE MIXED IN WITH THE OTHER PHASE

Even though oil and water do not mix, after shaking a bi-phase product some droplets can remain visible in the opposite phase. This is common, especially if you are using ingredients that have some degree of emulsifying capability, for example lecithin in oils, sterols in oils, or surfactants. Make sure you avoid using those ingredients. You can also increase the amount of salt in your formulation. If your serum is left to settle undisturbed, the droplets will disappear eventually.

THE COLOR OF MY PRODUCT IS NOT STRONG OR STABLE OVER TIME

Many natural colorants are not as stable or strong as the synthetic colorants. Carotenoids, which give a yellow to red color to the oil phase, are one of the most stable options, but if they are constantly exposed to sunlight they will fade in one to two years. Water soluble plant pigments (like anthocyanins) are even less stable – most of them fade within a couple of weeks of exposure to light. Their shade also depends on the pH and can be different in an acidic or alkaline pH.
To see how stable a colorant is, it is best to perform a stability test at an elevated temperature and exposure to light and oxygen. Some large-scale suppliers manufacture stabilized pigments that can be used in natural cosmetics. If you are a small-scale manufacturer, those might not be available to you. One way to achieve color is to take advantage of ingredients that have a color, for example by using green unrefined avocado oil, blue chamomile essential oil, orange coenzyme Q10, etc. Another way is to use synthetic colorants.

SUMMARY

In this lesson we looked at three issues you may encounter when creating bi-phase serums and how to solve them.

6.6 LABORATORY TEST REPORTS: BI-PHASE SERUMS

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6.6 LABORATORY TEST REPORTS: BI-PHASE SERUMS

In this lesson, we will cover:

1. **Interpreting challenge test results.**
2. **Preservative Efficacy Test results for our bi-phase serum formulas.**

If you are interested in the reports from the PETs we had carried out on formulas featured in this module you can find them in this lesson.

Please note: The results and reports only apply to the samples that we made and had tested. These reports are not transferable to products made by anyone else as your manufacturing conditions and ingredients will be different. You cannot use these reports as part of your product documentation.

INTERPRETING CHALLENGE TEST RESULTS

THE CHALLENGE TEST

In order to ensure your product is safe to use and store, you must submit it for experimental assessments. These tests will reveal whether the product displays microbial stability and effective preservation during its shelf-life.

Challenge testing checks how effective a preservative system is and whether it is capable of withstanding contamination. It simulates a consumer's use and storage of the product, at room temperature, by contaminating the finished cosmetic product. Calibrated inocula incorporates relevant strains of microorganisms into the product, which is then monitored. The reaction of the product allows you to evaluate the adequacy of its preservation.

After the product has been contaminated, the number of surviving microorganisms in the mixture is recorded at predetermined intervals over a 28 day period. For each time and strain, a log reduction value is calculated. This figure is compared to the minimum values required to pass the test.

There are various protocols for challenge tests (ISO standard and European Pharmacopoeia are commonly used), and most of the protocols utilize the microorganisms listed below. However, some protocols use additional species. For a comparison of two protocols, please see: www.teknoscienze.com/Contents/Riviste/PDF/HPC2_2013_RGB_34-41.pdf

The following strains of microorganisms are most commonly used to contaminate the samples:

- *Pseudomonas aeruginosa*.
- *Staphylococcus aureus*.
- *Candida albican*.
- *Aspergillus brasiliensis* (previously *A. niger*).

Log reductions

The difference of CFUs (Colony Forming Unit; it basically means 'viable microorganisms') – if any – between the start and the time of recordings (ie at 14 and 28-day intervals) determines whether the preservative system is working properly. This is then stated as a log reduction.

The larger the log reduction, the more effective the product's preservation properties.

In order to pass the challenge test, both of the following requirements have to be met:

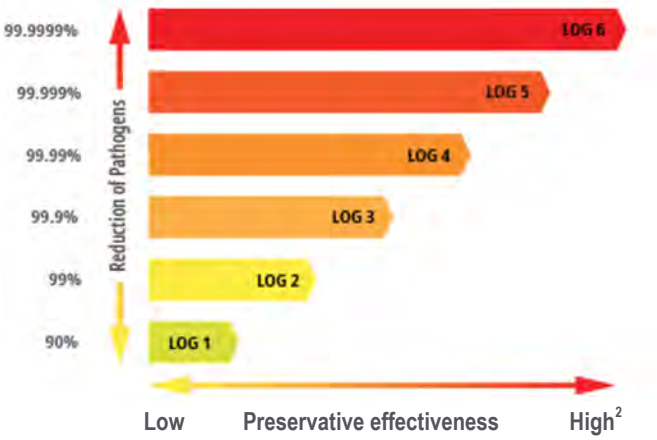
1. A 2 log reduction in the number of microorganisms, after 14 days, compared to the count at the start of testing.
2. A 0.5 log reduction in the number of microorganisms, after 28 days, compared to the count after 14 days[1].

It is key that the log reduction meets these minimum values.

Interpretation of log reductions[2]

Log reduction	Number of CFUs	Percentage reduction (%)	Times smaller
0 log (Log0)	1,000,000	0	N/A
1 log (Log1)	100,000	90	x10
2 log (Log2)	10,000	99	x100
3 log (Log3)	1,000	99.9	x1,000
4 log (Log4)	100	99.99	x10,000
5 log (Log5)	10	99.999	x100,000
6 log (Log6)	1	99.9999	x1,000,000

Represented graphically:



To better demonstrate a log reduction, below is one of our creams which has passed the preservative efficacy test with a high level of log reduction[3]

FRANKINCENSE FACE CREAM FOR MATURE SKIN WITH COENZYME Q10

Formula

Phase	INCI name	Trade name	Function	w/w%
A	Aqua	Purified water (deionized)	Solvent	66.85
A1	Gluconolactone (and) Sodium Benzoate	Geogard Ultra	Preservative	1.00
A2	Aloe Barbadensis Leaf Juice Powder	Aloe vera powder 200:1	Humectant, soothing	0.05
A2	Hydrolyzed Wheat Protein	Hydrolyzed wheat protein	Humectant, skin conditioning	2.00
A2	Sodium Phytate (and) Aqua (and) Alcohol	Dermofeel PA-3	Chelating agent	0.10
A3	Glycerin	Glycerin	Humectant	2.00
A3	Xanthan Gum	Xanthan gum	Thickener	0.20
B	Butyrospermum Parkii (Shea Butter)	Shea butter	Emollient	4.00
B	Triticum Vulgare (Wheat) Germ Oil	Wheatgerm oil	Emollient	4.00
B	Rosa Canina Fruit Oil	Rosehip oil	Emollient	3.00
B	Cetyl Alcohol	Cetyl alcohol	Thickener, stabilizer	2.00
B	Cetearyl Olivate (and) Sorbitan Olivate	Olivem 1000	Emulsifier	6.00
C	Squalane (Olive)	Squalane	Water loss prevention, anti-aging	5.00
C	Ubiquinone	Coenzyme Q10 (pure powdered form)	Active, antioxidant	1.00
D	Potassium Sorbate	Potassium sorbate	Preservative booster	0.20
D	Boswellia Carterii (Frankincense) Oil	Frankincense essential oil	Fragrance, active	0.50
D	Tocopherol	Vitamin E (95% mixed tocopherols)	Antioxidant	0.10
D	Panthenol	D panthenol	Humectant, moisturizing, cell regeneration	2.00

Test Strains:			Total viable counts per g of product
Staphylococcus aureus	ATCC	6538	152000
Pseudomonas aeruginosa	ATCC	9027	161000
Candida albicans	ATCC	10321	88000
Aspergillus brasiliensis	ATCC	16404	97000

Procedure

1. The sample was inoculated with the reference inocula according to the test method above.
2. Total viable counts were performed at 7,14 and 28 days after inoculation.

Results after inoculation

Test Strains:		Colony forming units (CFU) per g		
	Inoculum	7 Days	14 Days	28 Days
Staphylococcus aureus	152000	0	0	0
Pseudomonas aeruginosa	161000	0	0	0
Candida albicans	88000	0	0	0
Aspergillus brasiliensis	97000	12	0	0

Test Strains:	Logarithmic decrease of plate counts			Result
	7 Days	14 Days	28 Days	ISO 11930*
Staphylococcus aureus	5.182	5.182	5.182	A, NIL
Pseudomonas aeruginosa	5.207	5.207	5.207	A, NIL
Candida albicans	4.944	4.944	4.944	A, NIL
Aspergillus brasiliensis	3.908	4.987	4.987	A, NIL

Interpretation of results:

The first highlighted area shows the change in the colonies: there are 12 colonies of *Aspergillus brasiliensis* after seven days of inoculation.

The second highlighted area represents how the 12 colonies of *A. brasiliensis* affected the plate count (the number of actively growing cells) after seven days of inoculation. The increase from 3.908 to 4.987 reflects a decrease of 12 CFUs between the 7 and 14 day report in plate counts of *A. brasiliensis*.

Overall, the study report from the lab indicates a 5 log reduction, which corresponds to a percent reduction between 99.999 and 99.99, which is a high pass, also known as an 'A' pass.

As you will see on the following pages, all of the bi-phase formulas included in this module passed preservative efficacy testing with an A pass as indicated by A, NIL in the last row of the final column of each test report.

PRESERVATIVE EFFICACY TEST RESULTS FOR OUR BI-PHASE SERUM FORMULAS

Anti-redness Bi-phase Serum with Gotu Kola

Preservative Efficacy Testing

Test in analogy to ISO 11930 2.013-05-01

Test performed for:

Customer:

Material Tested: SER6212

ID: OB PET 2960 Date: 10/08/2021

Test Strains:			**Total viable counts per g of product**
Staphylococcus aureus	ATCC	6538	6,410,000
Pseudomonas aeruginosa	ATCC	9027	5,490,000
Candida albicans	ATCC	10321	198,000
Aspergillus brasiliensis	ATCC	16404	485,000

Procedure

1. The sample was inoculated with the reference inocula according to the test method above.
2. Total viable counts were performed at 7,14 and 28 days after inoculation.

Results after inoculation

Test Strains:	Colony forming units (CFU) per g			
	Inoculum	7 Days	14 Days	28 Days
Staphylococcus aureus	6,410,000	0	0	0
Pseudomonas aeruginosa	5,490,000	0	0	0
Candida albicans	198,000	0	0	0
Aspergillus brasiliensis	485,000	0	0	0

Test Strains:	Logarithmic decrease of plate counts			Result
	7 Days	14 Days	28 Days	ISO 11930*
Staphylococcus aureus	6.807	6.807	6.807	A, NIL
Pseudomonas aeruginosa	6.740	6.740	6.740	A, NIL
Candida albicans	5.297	5.297	5.297	A, NIL
Aspergillus brasiliensis	5.686	5.686	5.686	A, NIL

*Criteria A

The microbiological risk is considered to be tolerable (the cosmetic product is protected against microbial proliferation that may present a potential risk for the user) and the cosmetic product is deemed to meet the requirements ISO 11930.

Criteria B

The microbiological risk analysis demonstrates the existence of control factors not related to the formulation; for example, a protective package such as a pump provides a higher level of protection than a jar (see Annex D, ISO 11930). This would be considered a protective device for risk reduction.

The resulting criteria were obtained by the calculation method laid down in ISO 11930 2013-5-1.

Conclusion

The results apply only to the sample tested. When assessed against the ISO 11930 criteria for topical products, this sample meets the current ISO 11930 criteria for the Efficacy of Antimicrobial Preservation Test.

PRESERVATIVE EFFICACY TEST RESULTS FOR OUR BI-PHASE SERUM FORMULAS

Anti-pollution Bi-phase Serum

Preservative Efficacy Testing

Test in analogy to ISO 11930 2.013-05-01

Test performed for:

Customer:

Material Tested: SER6313

ID: OB PET 2963 Date: 10/08/2021

Test Strains:			**Total viable counts per g of product**
Staphylococcus aureus	ATCC	6538	6,410,000
Pseudomonas aeruginosa	ATCC	9027	5,490,000
Candida albicans	ATCC	10321	198,000
Aspergillus brasiliensis	ATCC	16404	485,000

Procedure

1. The sample was inoculated with the reference inocula according to the test method above.
2. Total viable counts were performed at 7,14 and 28 days after inoculation.

Results after inoculation

Test Strains:	Colony forming units (CFU) per g			
	Inoculum	7 Days	14 Days	28 Days
Staphylococcus aureus	6,410,000	0	0	0
Pseudomonas aeruginosa	5,490,000	0	0	0
Candida albicans	198,000	0	0	0
Aspergillus brasiliensis	485,000	0	0	0

Test Strains:	Logarithmic decrease of plate counts			Result
	7 Days	14 Days	28 Days	ISO 11930*
Staphylococcus aureus	6.807	6.807	6.807	A, NIL
Pseudomonas aeruginosa	6.740	6.740	6.740	A, NIL
Candida albicans	5.297	5.297	5.297	A, NIL
Aspergillus brasiliensis	5.686	5.686	5.686	A, NIL

*Criteria A

The microbiological risk is considered to be tolerable (the cosmetic product is protected against microbial proliferation that may present a potential risk for the user) and the cosmetic product is deemed to meet the requirements ISO 11930.

Criteria B

The microbiological risk analysis demonstrates the existence of control factors not related to the formulation; for example, a protective package such as a pump provides a higher level of protection than a jar (see Annex D, ISO 11930). This would be considered a protective device for risk reduction.

The resulting criteria were obtained by the calculation method laid down in ISO 11930 2013-5-1.

Conclusion

The results apply only to the sample tested. When assessed against the ISO 11930 criteria for topical products, this sample meets the current ISO 11930 criteria for the Efficacy of Antimicrobial Preservation Test.

PRESERVATIVE EFFICACY TEST RESULTS FOR OUR BI-PHASE SERUM FORMULAS

Exfoliating AHA Bi-phase Serum

Preservative Efficacy Testing

Test in analogy to ISO 11930 2.013-05-01

Test performed for:

Customer:

Material Tested: SER6414

ID: OB PET 2957 Date: 10/08/2021

Test Strains:			**Total viable counts per g of product**
Staphylococcus aureus	ATCC	6538	6,410,000
Pseudomonas aeruginosa	ATCC	9027	5,490,000
Candida albicans	ATCC	10321	198,000
Aspergillus brasiliensis	ATCC	16404	485,000

Procedure

1. The sample was inoculated with the reference inocula according to the test method above.
2. Total viable counts were performed at 7,14 and 28 days after inoculation.

Results after inoculation

Test Strains:	Colony forming units (CFU) per g			
	Inoculum	7 Days	14 Days	28 Days
Staphylococcus aureus	6,410,000	0	0	0
Pseudomonas aeruginosa	5,490,000	0	0	0
Candida albicans	198,000	0	0	0
Aspergillus brasiliensis	485,000	0	0	0

Test Strains:	Logarithmic decrease of plate counts			Result
	7 Days	14 Days	28 Days	ISO 11930*
Staphylococcus aureus	6.807	6.807	6.807	A, NIL
Pseudomonas aeruginosa	6.740	6.740	6.740	A, NIL
Candida albicans	5.297	5.297	5.297	A, NIL
Aspergillus brasiliensis	5.686	5.686	5.686	A, NIL

*Criteria A

The microbiological risk is considered to be tolerable (the cosmetic product is protected against microbial proliferation that may present a potential risk for the user) and the cosmetic product is deemed to meet the requirements ISO 11930.

Criteria B

The microbiological risk analysis demonstrates the existence of control factors not related to the formulation; for example, a protective package such as a pump provides a higher level of protection than a jar (see Annex D, ISO 11930). This would be considered a protective device for risk reduction.

The resulting criteria were obtained by the calculation method laid down in ISO 11930 2013-5-1.

Conclusion

The results apply only to the sample tested. When assessed against the ISO 11930 criteria for topical products, this sample meets the current ISO 11930 criteria for the Efficacy of Antimicrobial Preservation Test.

SUMMARY

In this lesson we shared with you the PET reports for formulas presented in this module. These are for your learning only and cannot be used as part of your product documentation.

REFERENCES

1. https://oxfordbiosciences.com/challenge-testing
2. https://www.endurocide.com/news/understanding-the-role-of-effective-disinfection-in-infection-control/
3. https://microchemlab.com/information/log-and-percent-reductions-microbiology-and-antimicrobial-testing