How to select Green Chemistry Ingredients for Cosmetic Protection

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The Green Chemist Consultancy

Agenda

- Why green chemistry ingredients for cosmetic protection
- How to start the selection process
- A simple example with an interactive tool
- Conclusions
- Questions

Why 1
Consumers desire for green and free from

- Paraben free along with other preservatives free from are a the most common green claim (source Mintel)
- Even if free from is not permitted in Europe, the general public is still looking for it

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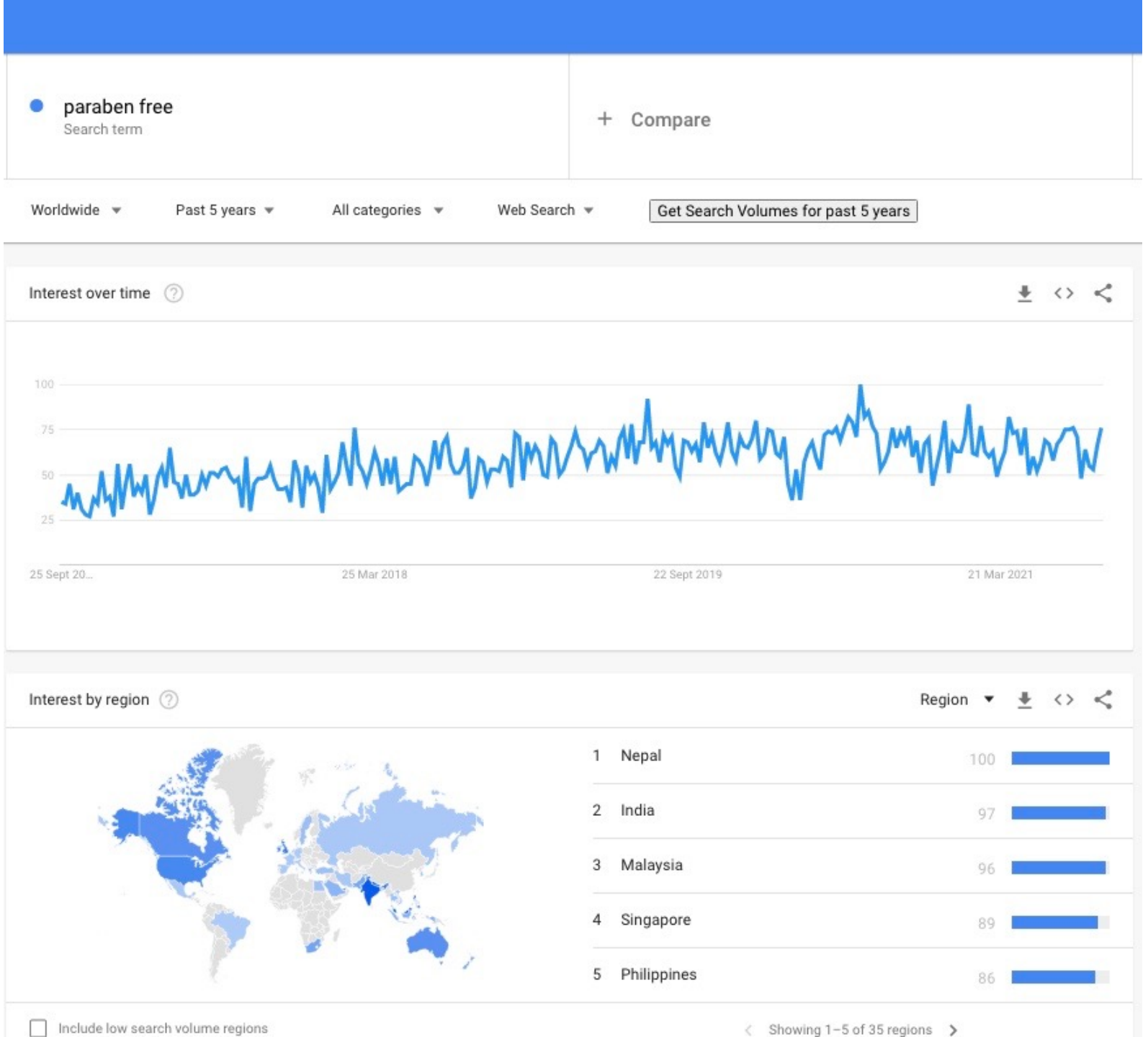
5 years Global trend On Google trends



paraben free 195 alphabeticals

a

Image

- paraben free antiperspirant
- paraben free and sulphate free shampoo
- paraben free anti aging cream
- paraben free anti wrinkle cream
- paraben free anti dandruff shampoo
- paraben free after sun lotion
- paraben free and sulfate free shampoo
- paraben free aloe vera gel

b

Image

- paraben free body lotion
- paraben free body wash
- paraben free body lotion uk
- paraben free baby products
- paraben free body butter
- paraben free bubble bath
- paraben free bronzer
- paraben free beauty products

c

Image

- paraben free conditioner
- paraben free cleanser
- paraben free concealer
- paraben free candles
- paraben free cosmetics
- paraben free colour shampoo
- paraben free cream
- paraben free cerave

d

Image

- paraben free deodorant
- paraben free deodorant uk
- paraben free deodorant boots
- paraben free dry shampoo
- paraben free dog shampoo
- paraben free dandruff shampoo
- paraben free dog shampoo uk
- paraben free definition

e

Image

- paraben free eyeshadow
- paraben free eyeliner
- paraben free eye cream
- paraben free eyebrow pencil
- paraben free eye makeup remover
- paraben free eye cream uk
- paraben free emollient cream
- paraben free exfoliator

f

Image

- paraben free face wash
- paraben free foundation
- paraben free face cream
- paraben free fake tan
- paraben free face wash uk
- paraben free face moisturiser uk
- paraben free fragrance oils
- paraben free face moisturizer

Why 2
Not many preservatives left

- Recent restrictions mean less preservatives available for the industry
- The cost for registering new preservatives is very high, so very unlikely new ones will be registered

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Why 3
Keep it low

- As the cosmetic industry is growing so is the exposure to preservatives
- Think of what happened with MCI and MI
- Therefore reducing preservatives exposure levels may safeguard them long term

Poll question

- What is the biggest challenge you face in building your preservative system today?
- Cost
- What to use
- Time
- Complexity
- Other (feel free to say it in the chat)

Green Chemistry

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From: “Green Chemistry, theory and practice” by Paul Anastas and John Warner

How do you use green chemistry for cosmetic preservation?

- Green chemistry ingredients with additional antimicrobial properties
- Emulsifiers, surfactants, humectants, skin conditioners, antioxidants, fragrances..
- Antimicrobial properties are usually not broad spectrum (either antibacterial, antifungal or might help boosting antimicrobials) and require synergistic blends for broad spectrum protection
- Many ready made blends available on the market, even containing preservatives from Annex V
- It is a more complex process

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First step: what is your preservative strategy?

- **Preservative free**
- **Use lower levels of preservatives** from Annex V in combination with green chemistry multi-functionals
- **Boost** your preservative system with a green chemistry booster

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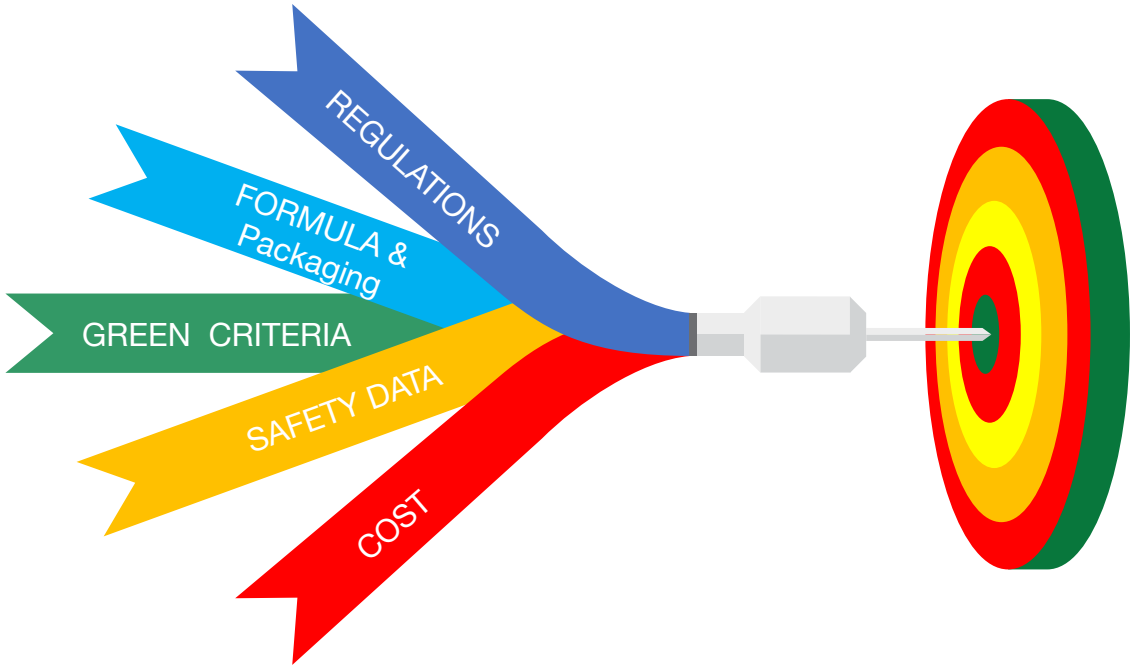
Several selection criteria



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Following steps

- **2** Green criteria: many shades of green, which one is yours?
- **3** Formula: what kind of formula is it? What is the pH?
- 4 Who is going to use this product and where will it be applied? What type of packaging?
- **5** In what countries is the product going to be sold?
- *6 Cost per kg of product*
- *7 Safety data: this is usually supplied by the supplier or by other good sources*
- *8 Test*

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Example

- 1 Preservative free
- 2 Green criteria: 100% plant derived, Cosmos compliant
- 3 Formula: mineral SPF, pH around 7, bottle with pump dispenser
- 4 Application: leave on, for the body
- 5 Where: Europe and USA
- *6 Check selection with safety advisor*
- *7 Check cost per kg of product*

Summary Chart 6 - Preservatives

Trade name	INCI	State	Use %	pH	°C	Cosmos status	NOI	Regs
		L	1.5-2.5	3.5-6	<80	A	0.88	EU, US, China, Pro 65
		L	1.5-2.5	4-6	<80	A	0.90	EU, US, China, Pro 65
		L	-	4-5.5	<80	A	1	EU, US, China, Pro 65
		S	<0.5	<5	-	A	1	EU, US, China, Pro 65
		L	1.5-2.5	3.5-6	<80	A	0.88	EU, US, China, Pro 65
		L	1.5-2	4-6	-	A	0.90	EU, US, China, Pro 65
		L	1-1.5	4-5.5	-	A	0.87	EU, US, Pro 65, China
		L	0.5-2	3-6.5	-	A	?	EU, US, China
		L	2-4	<6.5	-	A	?	EU, US, Pro 65, China
		L	0.5-2	3-6.5	-	-	?	EU, US, China, Pro 65
		L	0.5-2	3-6.5	-	-	?	EU, US, China, Pro 65
		S	0.75-2	3-6	-	A	0.75	EU, US, China, Pro 65
		L	0.6-1	4-8	60	A	0.15	EU, US, China, Pro 65
		L	0.5-1	<8	<40	A	0.1	EU, US, China? Pro 65?
		L	0.5-2	3-7	<120	A	1	EU, US, China, Pro 65
		L	0.5-2	3-9	<80	A	0.14	EU, US, China, Pro 65?
		L	0.5-2	3-9	<80	A	1	EU, US, Pro 65, China
		L	0.25-2	3-7	<40	A	1	EU, US, China, Pro 65

Summary Chart 7 - Broad Spectrum

Trade name	INCI	State	Use %	pH	°C	Cosmos status	NOI	Regs
	Leuconostoc Filtrate Filtrate, Aqua	L	2-4	3-7	<60	A	1	EU, US, China, Pro 65
	Leuconostoc/Radish Root Ferment Filtrate, Aqua	L	2-4	3-7	<70	A	1	EU, US, Pro 65, China
	Lactobacillus ferment, Aqua	L	2-4	3-7	<70	A	1	EU, US, Pro 65, China
	Lactobacillus Ferment, Lactobacillus, Cocos Nucifera Fruit Extract, Aqua	L	2-4	3-7	<70	A	1	EU, US, Pro
	Leuconostoc/Radish Root Ferment Filtrate, Lactobacillus, Cocos Nucifera Fruit Extract, Aqua	L	2-4	3-7	<70	A		
	Lactobacillus ferment, Aqua	L	2<	3-7	<70	A		
	Musa sapientum (banana) fruit extract, Aqua	L	2-3.2	4-10	<40	C		
	Silver oxide, Citric acid, Lactic acid, Aqua	L	0.5-1	4-6	<40	A		
	Silver	S	0.05-0.3	7-11	<40	A	0.1	C Pro 6
	Silver	S	0.05-0.3	7-11	<40	A	1	EU, US, China, Pro 65
	Silver lactate, Lactic acid, Aqua	L	0.5-1	4-5	<40	A	1	EU, US, Pro 65
Plantservative WsR	Lonicera japonica flower extract, Lonicera caprifolium flower extract Aqua	L	0.85-2	2-12	<95	C	1	EU, US, Pro 65, China
Plantservative WmR jojoba	Lonicara japonica flower extract, Lonicera caprifolium flower extract, Simmondisa chinensis seed oil	L	1-2	2-12	<95	C	1	EU, US, Pro 65, China
	Naringerin, Citrus grandis (Grapefruit) seed extract, Citrus aurantium, Hesperidin, Citrus reticulata (Tangerine) peel extract, Glycerin, Ascorbic acid, Lactic acid, Citric acid	L	1-2	2-10	<40	C	1	EU, US, Pro 65, China
	Xylityl sesquicaprylate	L	0.5-1.5	3.5-7	<45	A	1	EU, US, China, Pro 65

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Helping the selection process

Plus an ingredients section made of 164 raw materials from 47 suppliers all over the world

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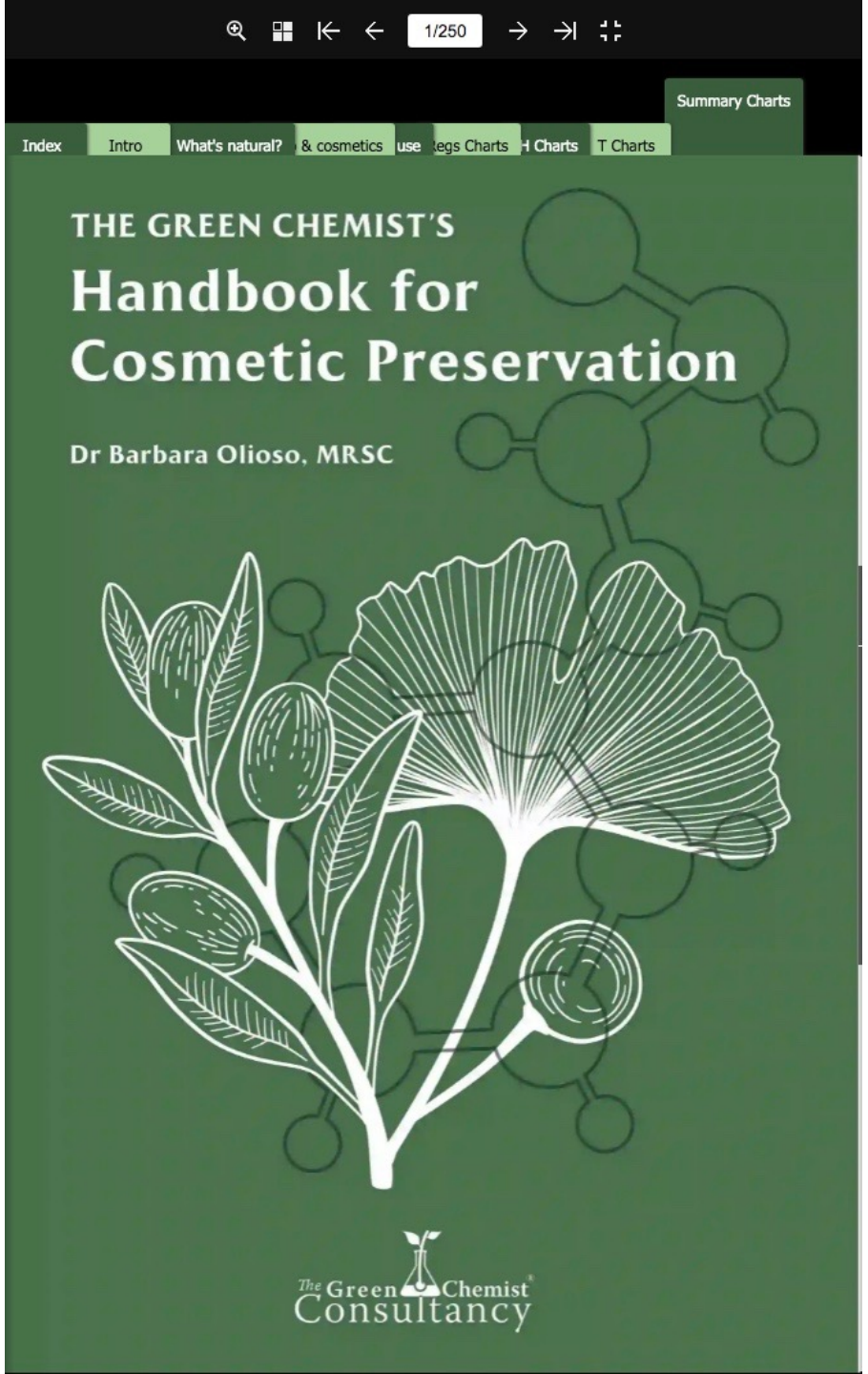

With this interactive ebook

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Selection via the pH chart

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Charts selection according to regulatory status and temperature stability

Plantservative WsR

by Campo Research

Green chemistry honeysuckle extract made from wildly cropped plants. Incompatible with citral as it turns slightly pink.

INCI names	**Lonicera japonica flower extract, Lonicera caprifolium flower extract Aqua**
CAS number	223749-79-9, 84903-62-3
Physical state	Liquid
Function	Conditioning
Effective pH range	2 to 12
Heat stability	<95C, 203F
Solubility	water
Recommended %	0.85 to 2
Antimicrobial type	Broad

To know more see my article on this material.

Green Status		Regulatory status			
Cosmos	ISO 16128	EU	US	Pro 65	China
Compliant	1	yes	yes	ok	yes

Plantservative WmR Jojoba

by Campo Research

Green chemistry honeysuckle extract made from wildly cropped plants.

INCI names	**Lonicara japonica flower extract, Lonicera caprifolium flower extract, Simmondisa chinensis seed oil caprifolium flower extract, Aqua**
CAS number	223749-79-9, 84903-62-3
Physical state	Liquid
Function	Conditioning
Effective pH range	2 to 12
Heat stability	<95C, 203F
Solubility	oil
Recommended %	1 to 2
Antimicrobial type	Broad

Green Status		Regulatory status			
Cosmos	ISO 16128	EU	US	Pro 65	China
Compliant	1	yes	yes	ok	yes

Conclusions

- A cosmetic preservative system is key factor in the decision making process of consumers today
- A preservative system with green chemistry credentials gives formulators a valid choice to formulate safe and competitive products
- The Green Chemist's handbook is an interactive e-tool to start the selection process for a green preservative system, saving time and energy
- Special 10% discount valid until the 30th of September, use the code **GREEN** at the checkout

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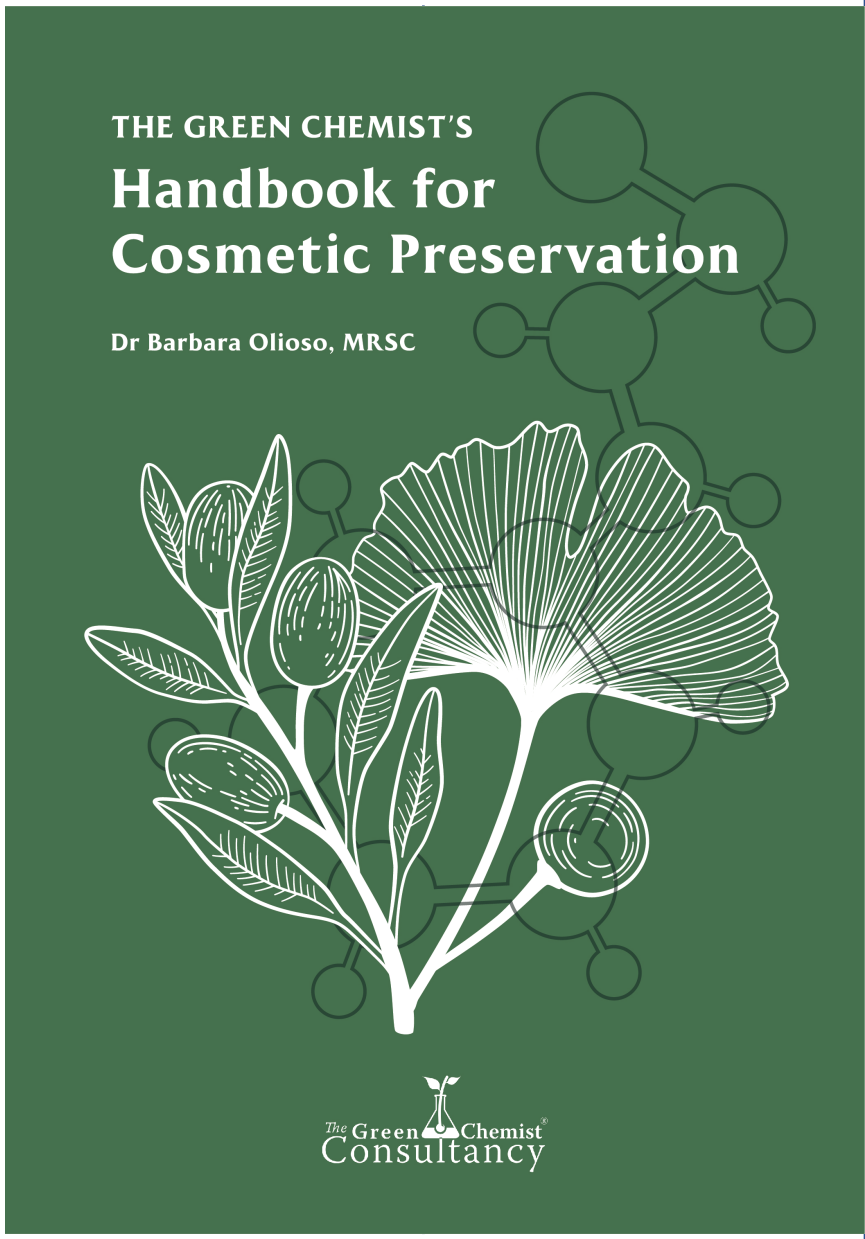

We can do it!
With Green Chemistry

Thank you for listening