Sunscreen Classification:
B. Chemical sunscreens

- They are usually combined with physical sunscreens or with each other to form high-SPF products
- Chemical sunscreens absorb ultraviolet radiation
- The absorbed radiation must then be dissipated as either heat or light.
- In most cases, the radiation simply is emitted again at a longer wavelength and does not lead to free radical formation

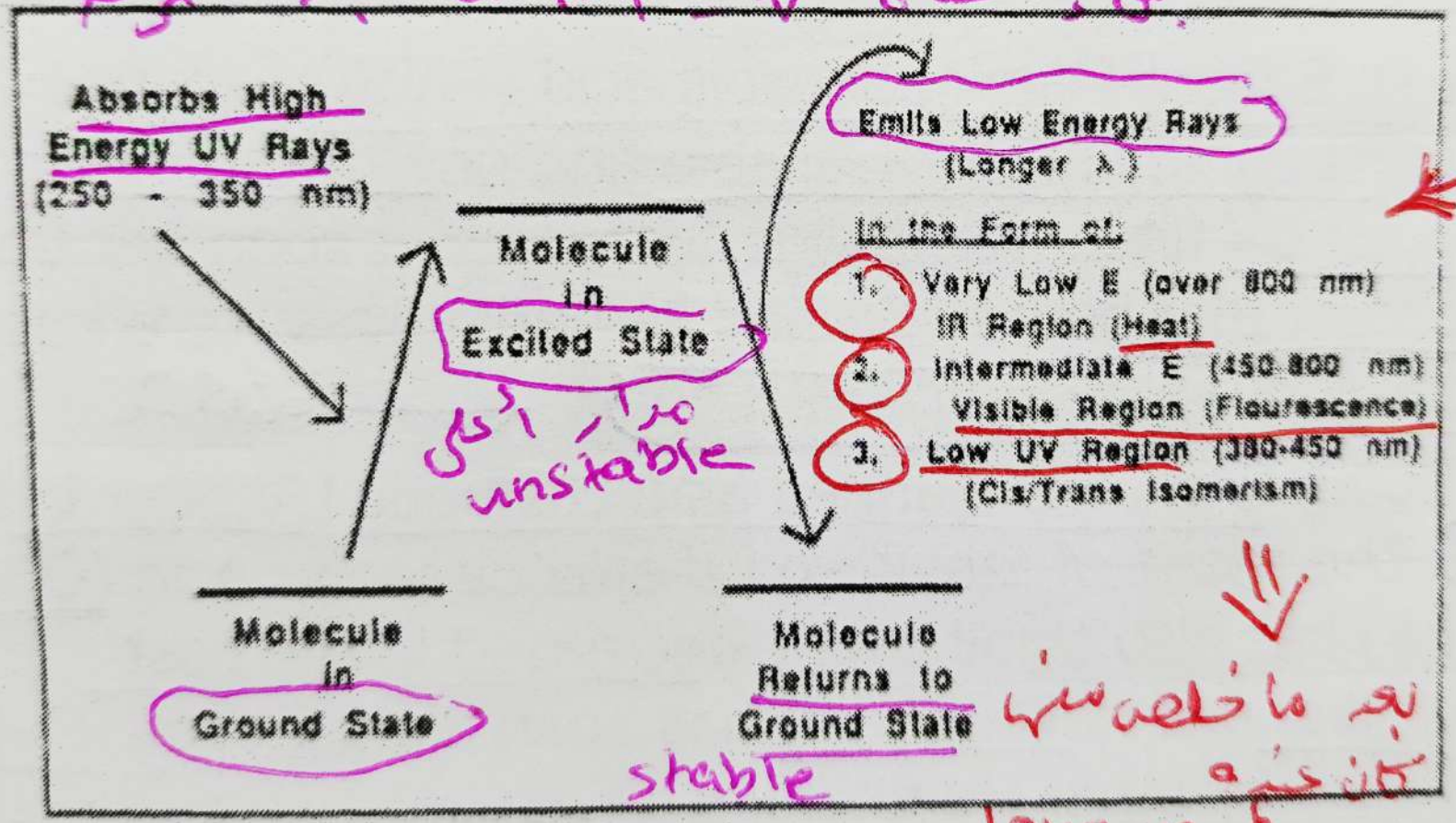
* الكيميكال عادةً بيعمل امتصاص لـ UVA، ومنها لـ UVB، ومنها بمتص التنين
* سبب التحويل للحرارة أو الضوء هو تقليل أثرها، والضرر

Sunscreen Classification:

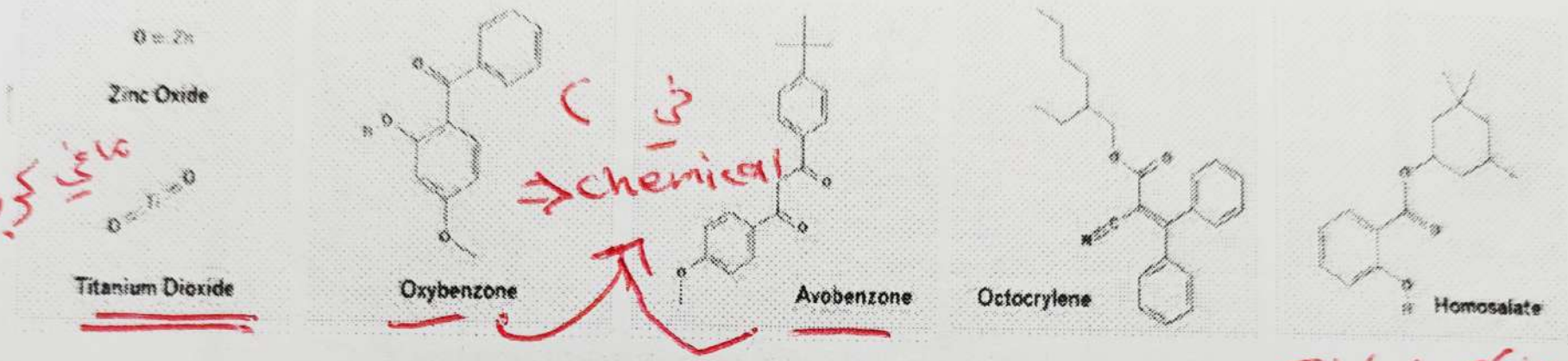
B. Chemical sunscreens

- Organic UV absorbers used in sun-screens possess aromatic moieties. The substitutions at the aromatic ring are of great importance for the UV spectroscopic properties.
- An increase in the number of resonance structures stabilizes the excited state

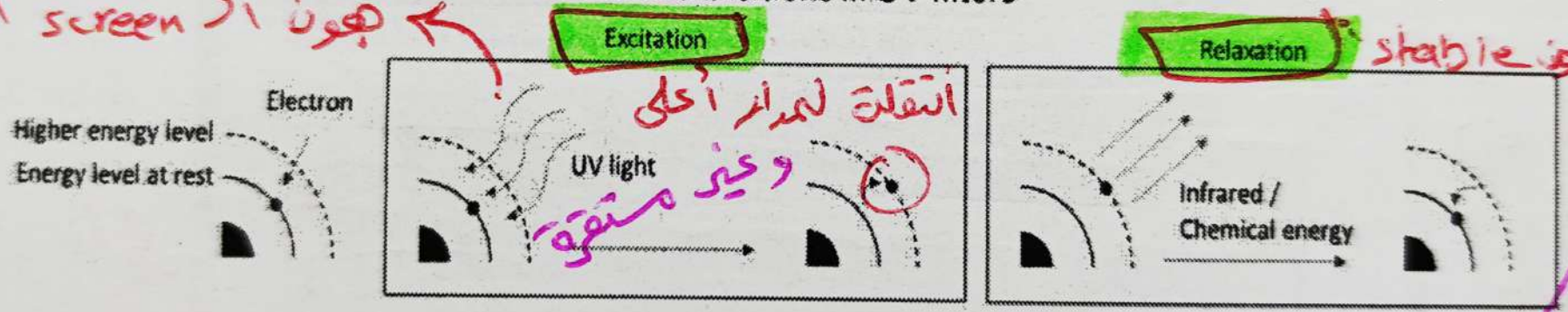
Sunscreen Classification:
B. Chemical sunscreens



Chemical structures of common UV filters



Electron transitions in UV filters



Sunscreens contain UV filters that absorb UV light and convert it into different forms of energy that are less harmful to the skin. (Chemical structures from PubChem)

https://ftloscience.com/soaking-up-sun-chemistry-behind-sunscreen/

Sunscreen Classification:
B. Chemical sunscreens

- They are synthetically prepared organic chemicals that can be labeled as UVB or UVA absorbing substances or both
- Colorless and often odorless agents that prevent UV radiation from penetrating the epidermis by acting as filters as they absorb and reflect UV radiation

Sunscreen Classification:
B. Chemical sunscreens

Drawbacks:

- Many chemical sunscreens have been reported to cause allergic or photoallergic reactions in susceptible people
- In addition, some of them are unstable when exposed to ultraviolet radiation. E.g. 15 minutes of solar-simulated light destroys 36% of avobenzone
- Some are systemically absorbed and levels have been demonstrated in the urine of humans using the product *(Hayden et al.: Systemic absorption of sunscreen after topical application. Lancet, 350: 863, 1997)* → chemical sunscreens should not be used in children under 2 years of age

THE CHEMISTRY OF SUNSCREEN

Summer sun brings with it the risk of sunburn, so we'll all be slapping on the sunscreen to guard against it. But what are the chemicals that keep you from turning as red as a lobster? This graphic looks at them and how they work.

TYPES OF UV RADIATION

UVA 320-400nm (wavelength)

Accounts for 95% of solar UV radiation reaching Earth's surface. Penetrates deepest into skin, and contributes to skin cancer via indirect DNA damage.

UVB 290-320nm (wavelength)

Accounts for 5% of solar UV radiation reaching Earth's surface. Causes direct DNA damage, and is one of the main contributors to skin cancer.

UVC 290-100nm (wavelength)

Filtered out by ozone in the Earth's atmosphere, and as a result does not reach the surface of the Earth, and doesn't cause skin damage.

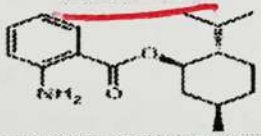
17

28

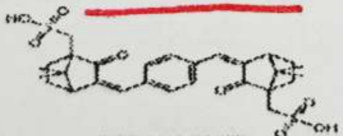
Inorganic chemicals in sunscreen, such as zinc oxide and titanium oxide, both absorb and scatter UV light. Organic chemicals are also used – the chemical bonds in these absorb UV radiation, with the chemical structure affecting whether they absorb UVA, UVB, or both. Several different chemicals are used in sunscreen to ensure full protection.

UVA BLOCKERS

AVOBENZONE



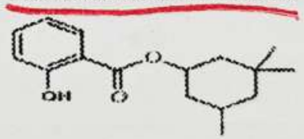
MENTHYL ANTHRANILATE



ECAMSULE

UVB BLOCKERS

OCTYL METHOXYCINNAMATE

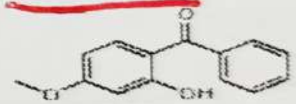


HOMOSALATE

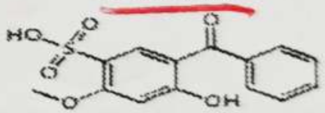
OTHER UVB BLOCKERS
(italicised = not approved in USA)

PABA	Octylocrylene
Padimate O	Ensulizole
Cinoxate	*Octyl triazone*
Octyl salicylate	*Enzacamene*
Trolamine salicylate	*Amiloxate*

UVA & UVB BLOCKERS



OXYBENZONE



SULISOBENZONE

OTHER UVA & UVB BLOCKERS
(italicised = not approved in USA)

Dioxybenzone	*Neo Heliopan AP*
Mexoryl XL	*Uvinul A Plus*
Tinosorb S	*UVAsorb HEB*
Tinosorb M	

All currently approved in EU, Canada & Australia

الصورة توضح
أنواع الـ sunscreen
بس الدكتورة ما بدها
نحكي blockers
لأنه ما في حيل إشي
نقدر نستدلها
Absorbie
filter أو

أمثلة

أمريكا بتعتبره drug مش ١٧ filter ما فيه Approve
بس أوروبا في ٢٨ filter أكثر وبتعتبروه cosmetics .
للاستخدام

B. Chemical sunscreens:

حنبلش كاني عنهم بالاسعار

B. Chemical sunscreens:

UVB-Absorbers or filter

1. *p*-Aminobenzoate derivatives (OD-PABA)

يعتبر واحد من أول الأنواع ظهورًا وأكثرها شيوعًا

- The UVB filter 4-aminobenzoic acid (PABA) was one of the first commercially available and one of the most popular UV filters worldwide. However, it soon became apparent that both PABA and its derivatives were known triggers of photoallergic reactions. ← مشكلته
- In 2008, PABA was banned as a cosmetic UV filter in the EU. The usage of ethylhexyl *p*-aminobenzoic acid (OD-PABA) has also significantly decreased in the past 20 years, and nowadays, it has been almost completely replaced by other UV filters.

بمحظور استخدامه بأوروبا

لهذا نوع من أنواع PABA

هو اد OD-PABA قل استخدامه كثير

أخر ٢٠ سنة وهلأ وقف استخدامه تقريبًا .

Intern J of Cosmetic Sci, Volume: 37, Issue: 1, Pages: 2-30, First published: 26 September 2014, DOI: (10.1111/ics.12165)

B. Chemical sunscreens:

B. Chemical sunscreens: UVB-Absorbers

2 Cinnamate derivatives

- Ethylhexyl methoxycinnamate (EHMC, Octyl methoxycinnamate, OMC, octinoxate) is one of the most common UV filters worldwide and is often used in combination with other UVB filters to achieve high SPF values.
- Cinnamates are poorly soluble in water → often included in water-resistant and very-water-resistant sunscreens
- Photoallergic reactions have been reported (rare)
- People allergic to this compound may also be allergic to fragrances and flavorings that contain cinnamic aldehyde and cinnamon oil

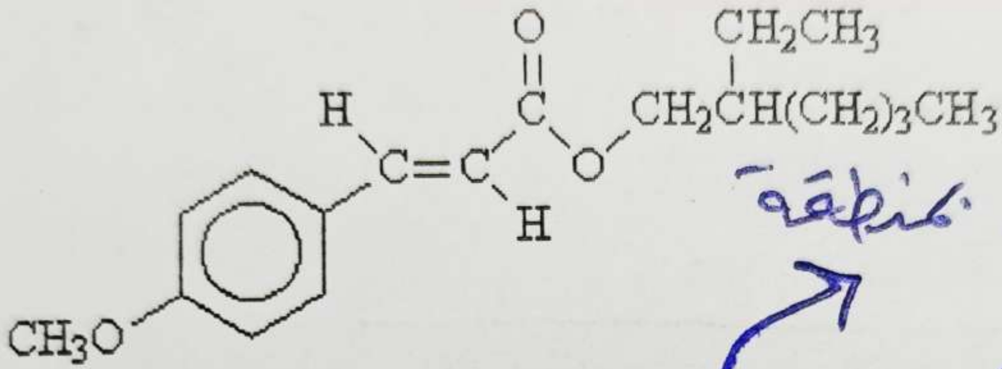
B. Chemical sunscreens:

UVB-Absorbers

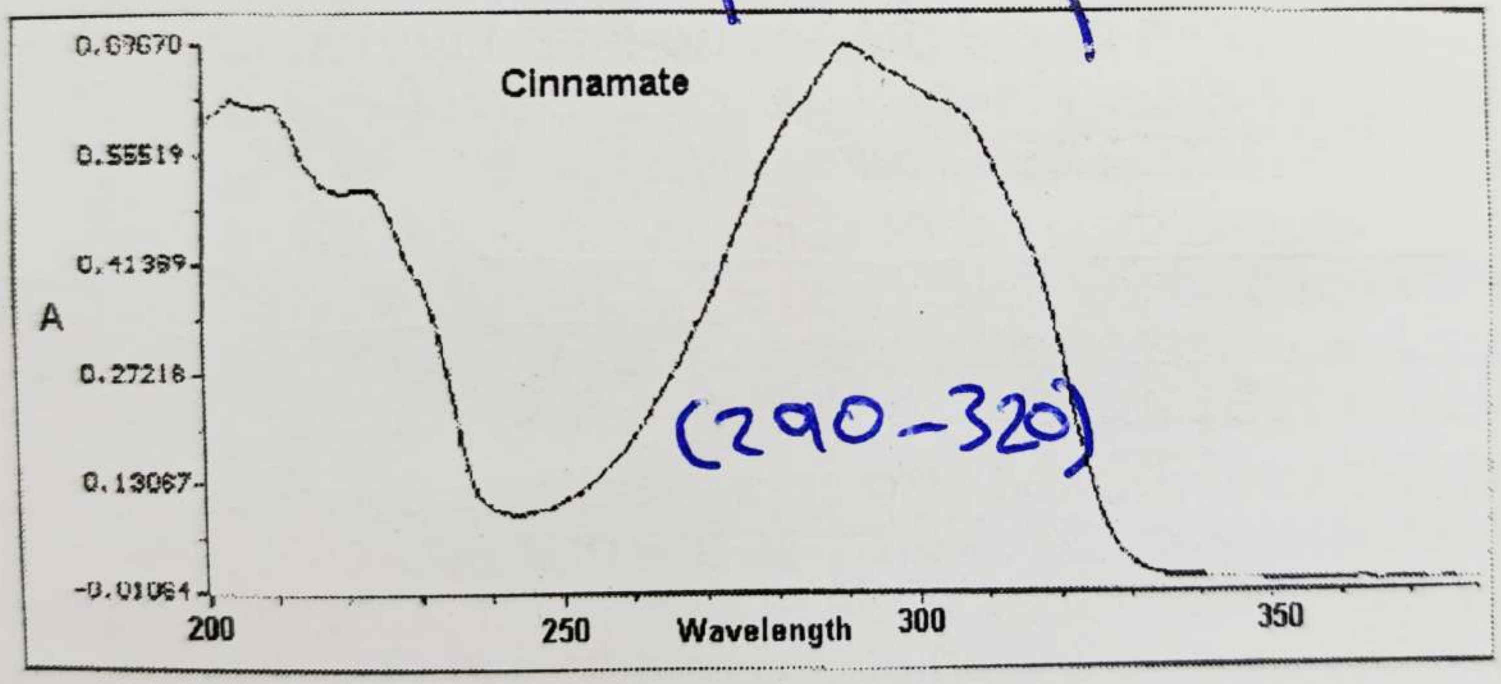
Cinnamate derivatives

- Octocrylene: The UVB filter OCR also belongs to the group of cinnamates. there is more and more evidence that OCR has developed into one of the most common photoallergens

Intern J of Cosmetic Sci, Volume: 37, Issue: 1, Pages: 2-30, First published. 25 September 2014, DOI: (10.1111/ics.12165)



الامتصاص هون هاي منطقة
ال UVB
لل Cinnamate.



B. Chemical sunscreens: UVB-Absorbers

3) Salicylate derivatives

- The UVB filters ethylhexyl salicylate (EHS) and homosalate are typical representatives of this group.
- Salicylate derivatives are rather weak UVB absorbers but are often used to augment other UVB filters.
- Due to their insolubility in water, they show good water resistance.

B. Chemical sunscreens:
UVB-Absorbers
Salicylate derivatives

ميزة هذه نادر ما يجمل تحسس

(١) ميزة
- Cosmetically used salicylates are rarely associated with allergic or photoallergic reactions, and do not have notable oestrogenic activity .

(٢) ميزة
- In addition, EHS shows only a slight tendency to penetrate the skin .

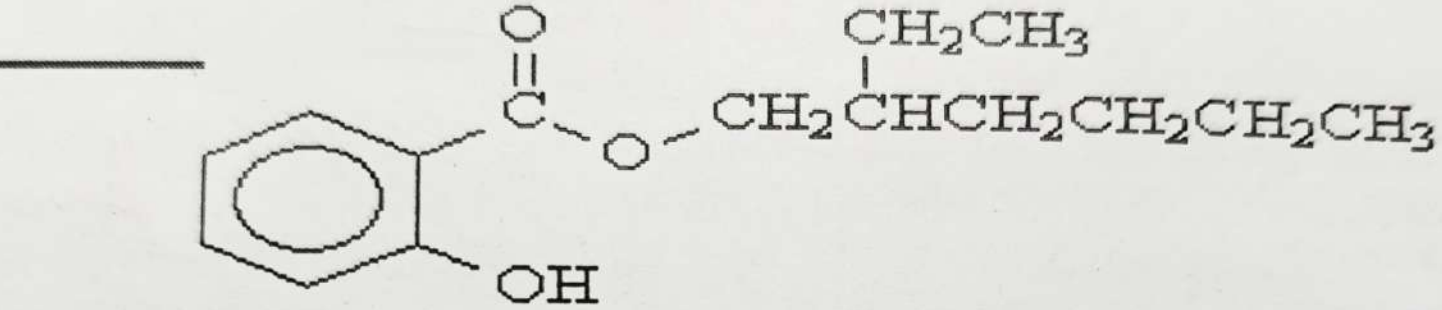
ما بتخش كل طبقات البشرة

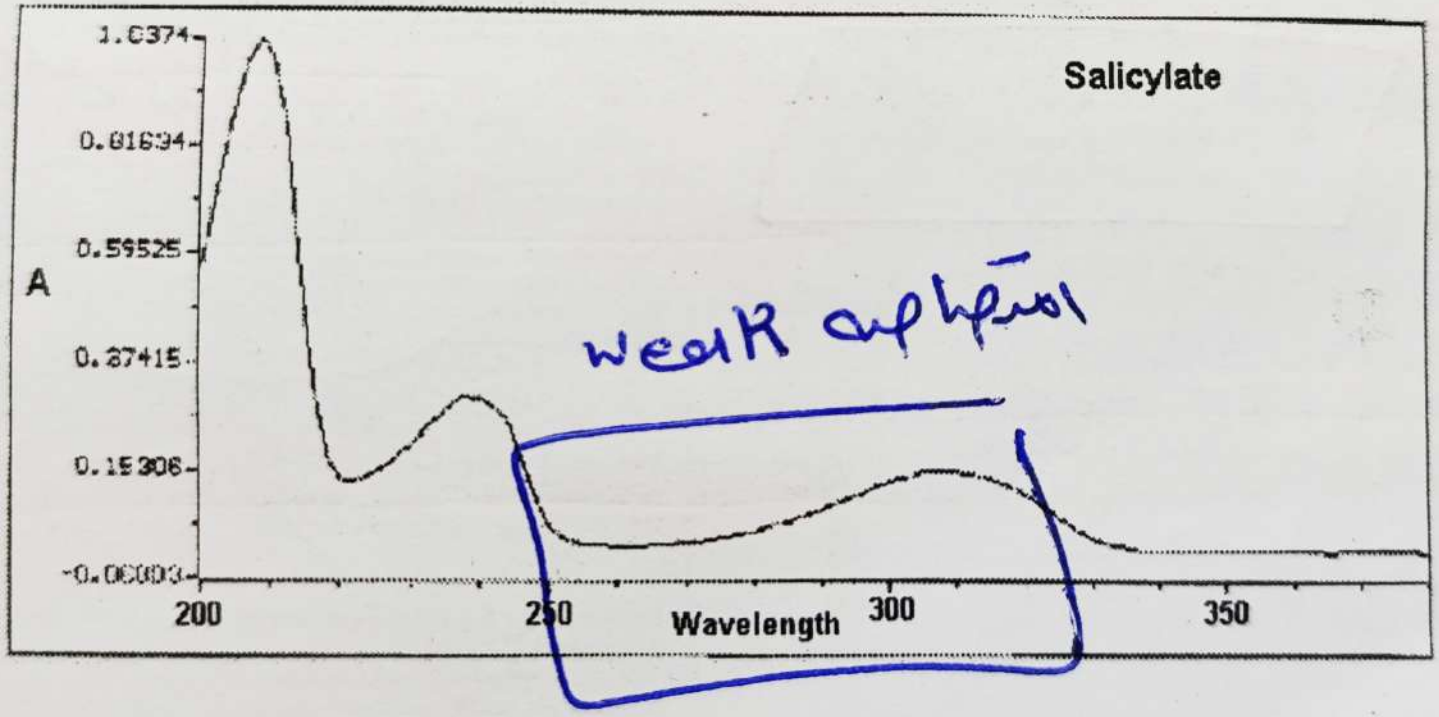
(٣) ميزة
- Therefore, especially EHS with its good photostability and solubility is a common ingredient in sunscreens

ما بيصير degredation مع التعرض للشمس

(٤)
- The UV absorber triethanolamine salicylate is water-soluble and is a typical photoprotective agent in hair care products.

إذا احتجت water soluble يكون UV filter فهاد خيار ممتاز بمنتجات الشعر




Salicylate
1.0374
0.81634
0.59525
0.37415
0.15306
-0.06803
A
200
250
Wavelength
300
350
weak aromatic

B. Chemical sunscreens: UVA-Absorbers

- UVA1 (> 340 nm)
- UVA2 (320-340 nm)

] 2 region

- Very few approved sunscreen agents are able to block in the UVA1 range
- A sunscreen's SPF gives no information about the product ability to block UVA

لهيك عم تقسيمها

لا حكيناها سابقًا إنه قيمة الـ SPF ما بتدل على قدرة المنتج على الـ block UVA.

B. Chemical sunscreens:

1) Camphor derivatives (3-BC + 4-MBC)

- Due to their excellent photostability, the camphor derivatives 3-benzylidene camphor (3-BC) and 4-methylbenzylidene camphor (4-MBC) were popular **UVB** filters for a long time.
- In the past several years, the camphor derivatives have been under more and more criticism due to their possible endocrine potential. The increasing pressure of the public and different non-governmental organizations resulted in the near cessation of use of 3-BC and 4-MBC in sun protection products in Germany
- Terephthalylidene dicamphor sulphonic acid (TDSA, **Mexoryl SX**), a further camphor derivative, is an effective **UVA** filter, which was developed and patented by L'Oréal (Paris, France) in 1982 and was approved in 1991 as cosmetic ingredient in Europe.
- In 2006, Mexoryl SX was also approved by the FDA as part of the sunscreen 'Anthelios SX'. This was the first approval of a product with a new UV filter since 1988. TDSA shows good protection ability against the negative effects of UVA radiation. In addition, TDSA is photostable and shows no tendency for percutaneous absorption.

Intern J of Cosmetic Sci, Volume: 37, Issue: 1, Pages: 2-30, First published: 26 September 2014, DOI: (10.1111/ics.12165)

KEY DERMATOLOGICAL

سرقت دفتر اخوك التوجيهي عشان اعطيكم من هالسلايد (:
اهم ...

من الأمثلة على ال Camphor derivatives هو ⇐ 4-MBC / 3-BC
وكان شائع استخدام ك UVB لإنهم Excellent Photostable
وما بتكسروا عند تعرضهم للشمس مثل Avobenzone .
ولكن ما بعد إشي كتير للأسف و وجدوا إنه بيعمل مشاكل على ال
Endocrine فـ قلل استخدامها وتقريبا توقف استخدامها بأماكن مثل المانيا

من الأمثلة الأخرى هي TDSA أو Mexoryl SX هاد ال وظيفته
بيعمل UVA filter وتم الموافقة على استخدامه في عام 1991
وبعام ٢٠٠٦ وافقت عليه ال FDA في منتج sunscreen اسمه
Anthelios SX موجود بالسلايد الجاية وبتبين إنه stable وما
بصيرله امتصاص عن طريق الجلد
⇓

① Photostable
② Percutaneous Absorption

وبس والله ...

SPF 15

DAILY MOISTURIZER

LA ROCHE-POSAY
LABORATOIRE DERMATOLOGIQUE

BROAD SPECTRUM
SPF15

ANTHELIOS SX
DAILY MOISTURIZING CREAM
with SUNSCREEN

UVA PROTECTION
with MEXORYL™ SX

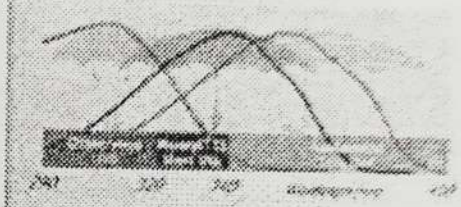
DAILY USE MOISTURIZER
UVA/UVB protection
24 hr long-lasting hydration

Fragrance-free PABA-free
Light, non-greasy
Suitable for sensitive skin

ANTHELIOS SX helps provide **protection from UVA rays.**

How does Mexoryl™ SX (ecamsule) protect you from UVA rays?

Parsol® 1789 (avobenzone) is very effective at the midpoint of the UVA spectrum, but provides less protection against short UVA wavelengths. **Mexoryl™ SX** (ecamsule) provides **peak efficacy** against these short **UVA rays.**



The combination of Parsol® 1789 (avobenzone) and **Mexoryl™ SX** (ecamsule) helps provide **UVA protection.**

Sun alert: Limiting sun exposure, wearing protective clothing, and using sunscreens may reduce the risks of skin aging, skin cancer, and other harmful effects of the sun.

Even if you do not burn, repeated exposure of unprotected skin while tanning may increase the risk of skin aging, skin cancer, and other harmful effects to the skin.

UVA rays, a daily skin concern

UVA rays have been shown to penetrate deeper into the skin, damaging its elasticity and contributing to premature skin aging.

UVB rays, also a skin concern

UVB rays cause sunburn and also contribute to premature skin aging.
SPF, or "**Sun Protection Factor**," is the **degree** of protection a sunscreen offers against UVB rays.

هاد اللي اخر موافقة بـ ٢٠٠٦

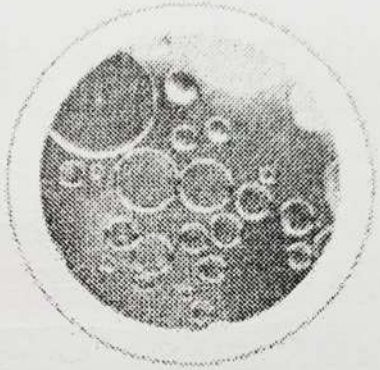
أي يكون Avobenzone + Mexoryl SX

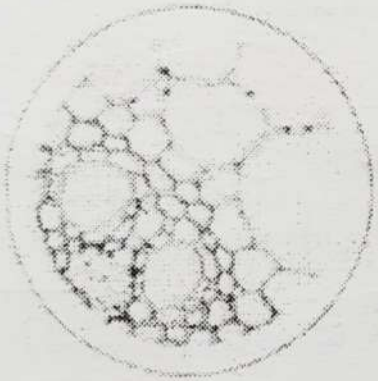
KEY DERMATOLOGICAL INGREDIENTS

MEXORYL™ SX

EXCLUSIVE ULTRAVIOLET A ABSORBER

Photostable UVA/UVB filters and powerful antioxidant protection





BROAD SPECTRUM SPF 15

OXYBENZONE-FREE & OCTINOXATE-FREE

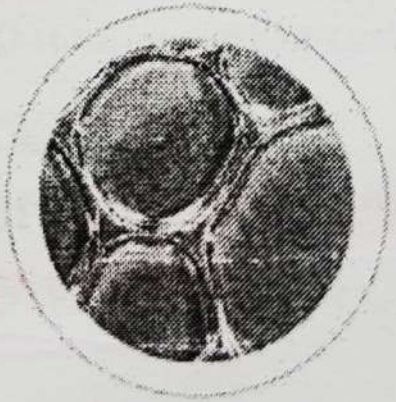
- Avobenzone 2%
- Ecamsule (Mexoryl™ SX) 2%
- Octocrylene 10%

مكونات

GLYCERIN

HUMECTANT

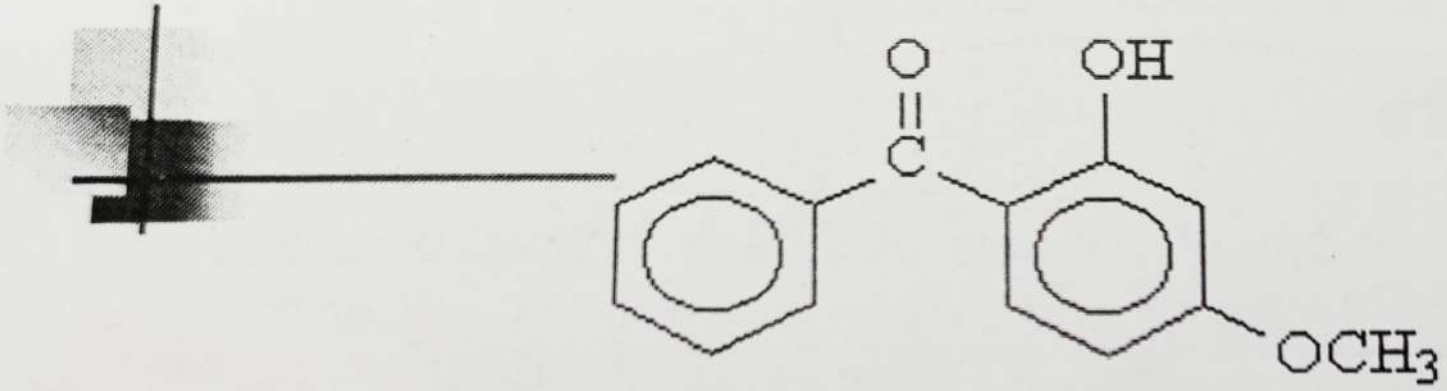
Known for its hydrating properties

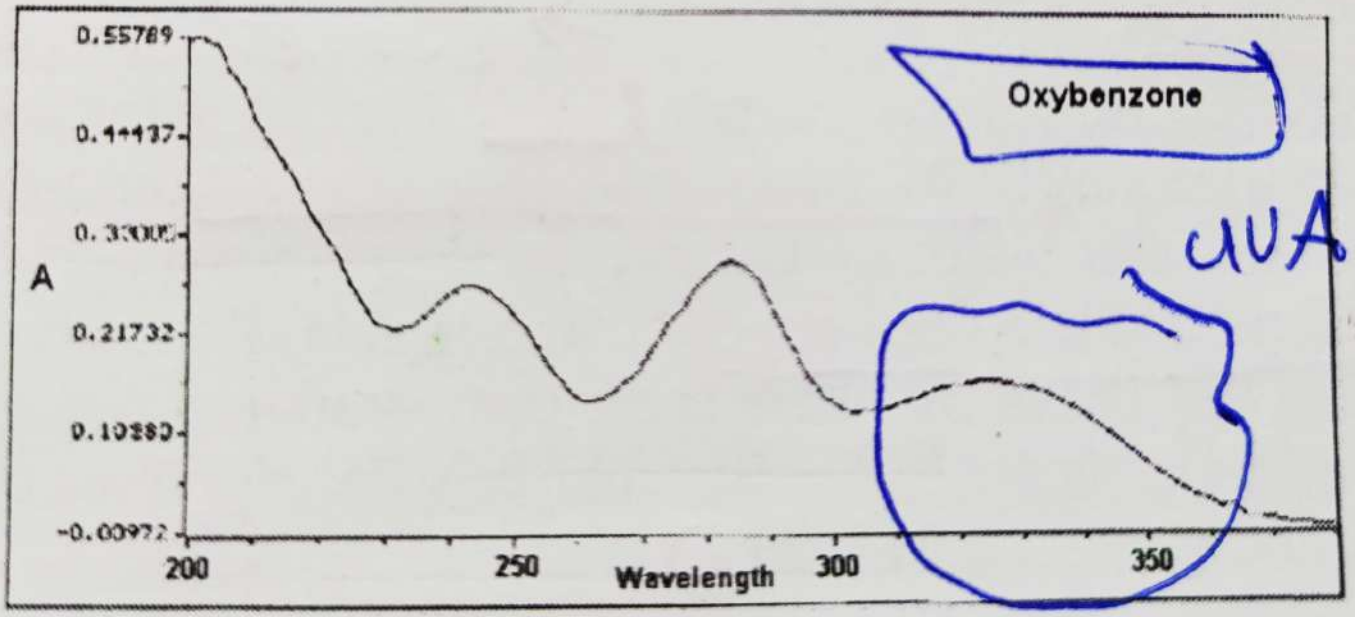


B. Chemical sunscreens: UVA-Absorbers

(2) ■ **Benzophenones:**

- Absorption range is in the range of 320-350 nm (absorption peak at 326 nm)
- Benzophenone-3 (Oxybenzone) is an absorber of UVA2
- The most common sunscreen agent to cause photoallergic contact dermatitis





Saja Hamed, Ph.D

Benzophenone derivatives

UVA/UVB Absorber

- The two UV filters benzophenone-3 (BP-3) and benzophenone-4 (BP-4), both approved in the EU, show very good photostability and broad-spectrum protection over the UVB and UVA ranges
- If used alone they do not provide complete UVA protection.
- Several studies have demonstrated that BP-3 shows a clear tendency to penetrate the human skin and was found in urine and even mother's milk. This is particularly critical because BP-3 is considered a substance with endocrine potential.
- In addition, BP-3 and BP-4 are seen as the most common photoallergens among the UV filters. Therefore, the usage of BP-3 and BP-4 in sun protection products in Germany decreased to a minimum.

B. Chemical sunscreens

UVA-Absorbers

Dibenzoylmethane derivatives

- Butyl methoxydibenzoylmethane (BMDBM) is the most common UVA filter in cosmetic products and is included in approximately 80% of the sun protection products in Germany
- BMDBM is also a known contact allergen among the UV filters
- Another critical point is the photoinstability of BMDBM, especially when it is used in combination with ethylhexyl methoxycinnamate (EHMC)
- The resulting photodegradation products also have a specific reaction potential and may be seen as further triggers for contact allergies. However, with an appropriate UV filter combination, for example with octocrylene (OCR) or by encapsulation, photodegradation can be decreased to a minimum.

مثال

موجود بنسبة ٨٠٪ بواقيات شمس المانيا

مستقر وبالذات مع EHMC

أو مع OCR

وبيعمل Allergy

B. Chemical sunscreens

UVA/UVB-Absorbers

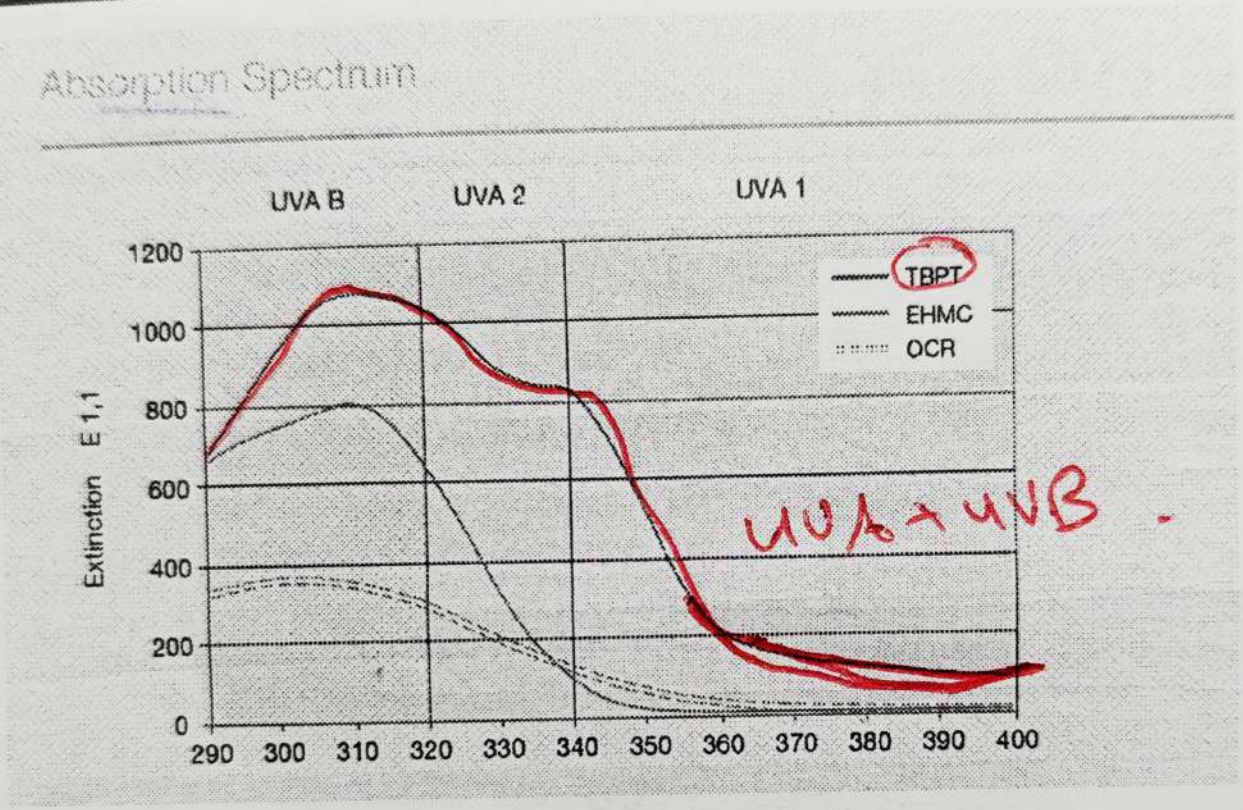
Triazones

- Recently, the development of new UV filters is based on the so-called 500 Da rule. With an increased molecular weight of more than 500 Da, skin penetration is reduced.
- This reduction is associated with increased safety and efficiency of such substances.
- The UVB filter ethylhexyl triazone (EHT), the UVB filter diethylhexyl butamido triazone (DEBT, iscotrizinol, Uvasorb HEB) and the broad-spectrum UV filter bis-ethylhexyloxyphenol methoxyphenyl triazine (BEMT, bemotrizinol, Tinosorb S) have a molecular weight well above 500 Da. These UV filters show comparatively high absorption coefficients, significant anti-inflammatory effects and are highly efficient and very photostable.

Newer Agent.

هاي الأنواع من UVB حجمها أكبر من ٥٠٠ دالتون
وامتصاصها عالي وفعالة اكو مضاد التهاب ومستقرة.
وما نقدر نستخدمها كـ raw material لأنها بتكون اخذت جهد كبير
وحصلت على براءة اختراع.

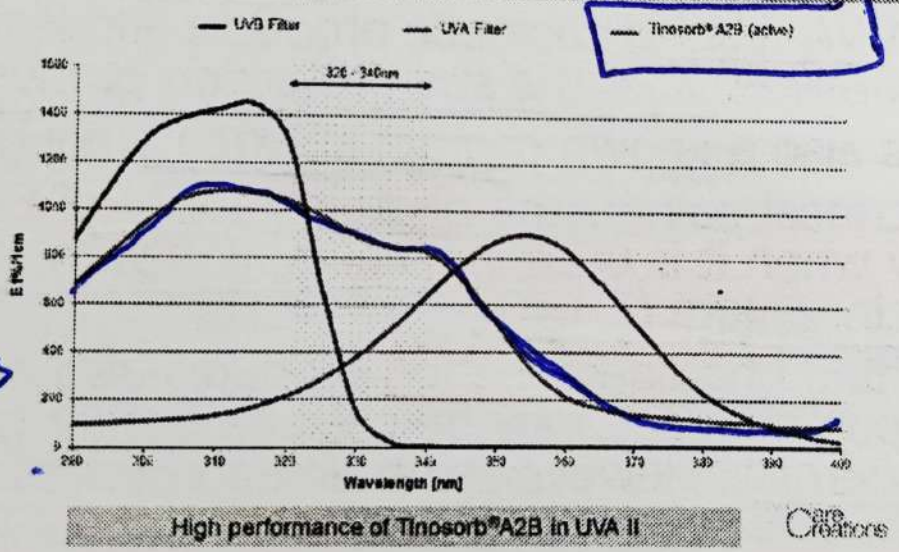
Efficient UVB and UVA2 filter



https://www.carecreations.basf.com/products-formulation/products/products-detail/TINOSORB-A2B/30478125

الصورة بتوضح كل امتصاص agent بأي UV
وكل ما صار الـ agent متطور اكثر بصير امتصاصه
بالمنطقتين اكثر UVA+UVB

Why a New UV Filter?



High performance of Tinosorb®A2B in UVA II

Tinosorb® A2B: An innovative broad-spectrum UV filter

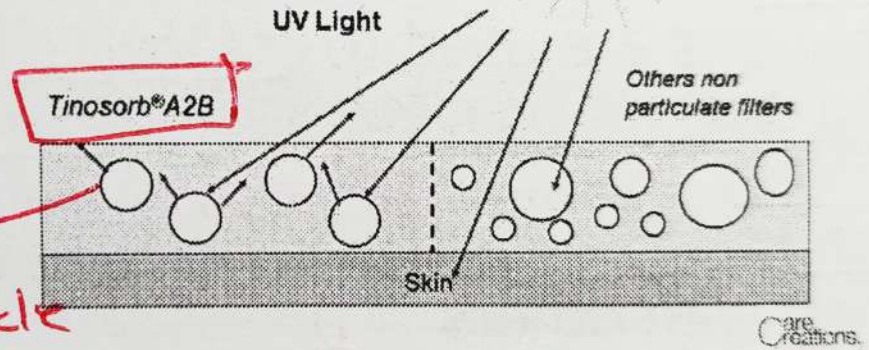
https://www.youtube.com/watch?v=enBw1VQkUio

هاد never agent قادر يغطي بمنطقة UVA + UVB عكس الباقيين واحد قادر يغطي منطقة الـ UVA والثاني الـ UVB !!

Particulate يتكون وجوده (suspension) أكبر من ٥٠٠ دالتون لهيك امتصاصه فقط عالطبقة العلوية من الجلد وبالتالي حمايته كل safety efficacy

Tinosorb®A2B –
Boosting effect with soluble UV filters

Performance by:
Absorption, Reflection & Scattering

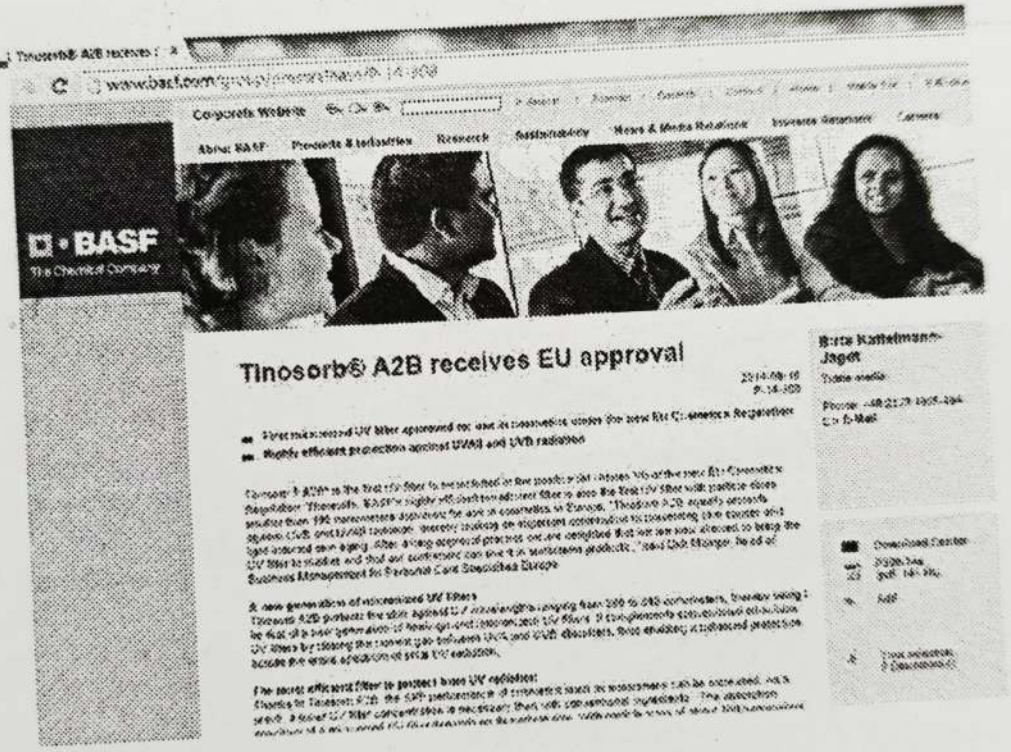


Tinosorb® A2B: An innovative broad-spectrum UV filter

عبارة عن Dispersion
يتكون من tiny particle
مستحضر ويتحمل
بطريقتين :-

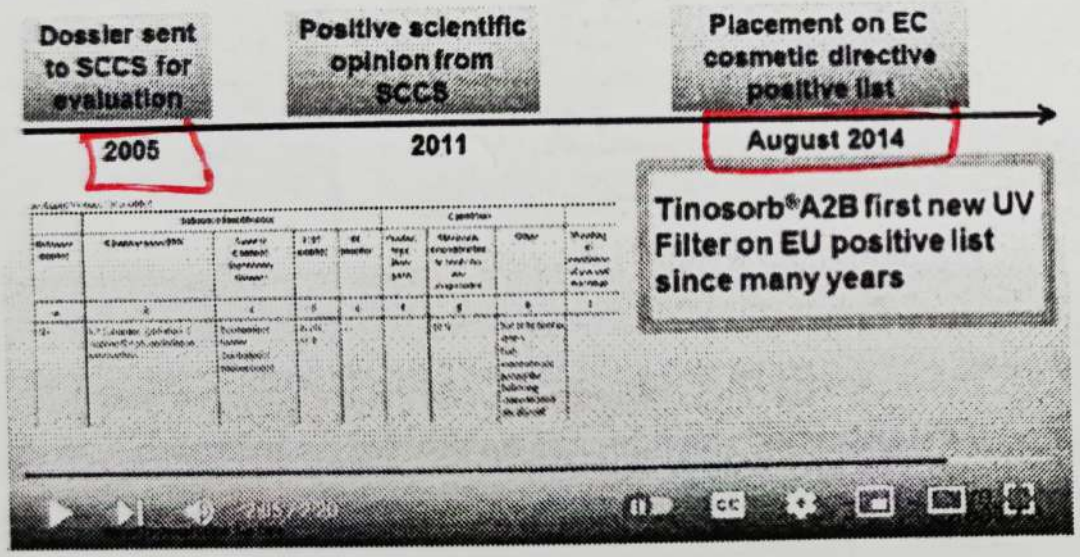
(١) امتصاص UV
أو
(٢) UV يعكس Reflect

حصل خلاف
Approve
بالواقي شمس
ب ٤ ات



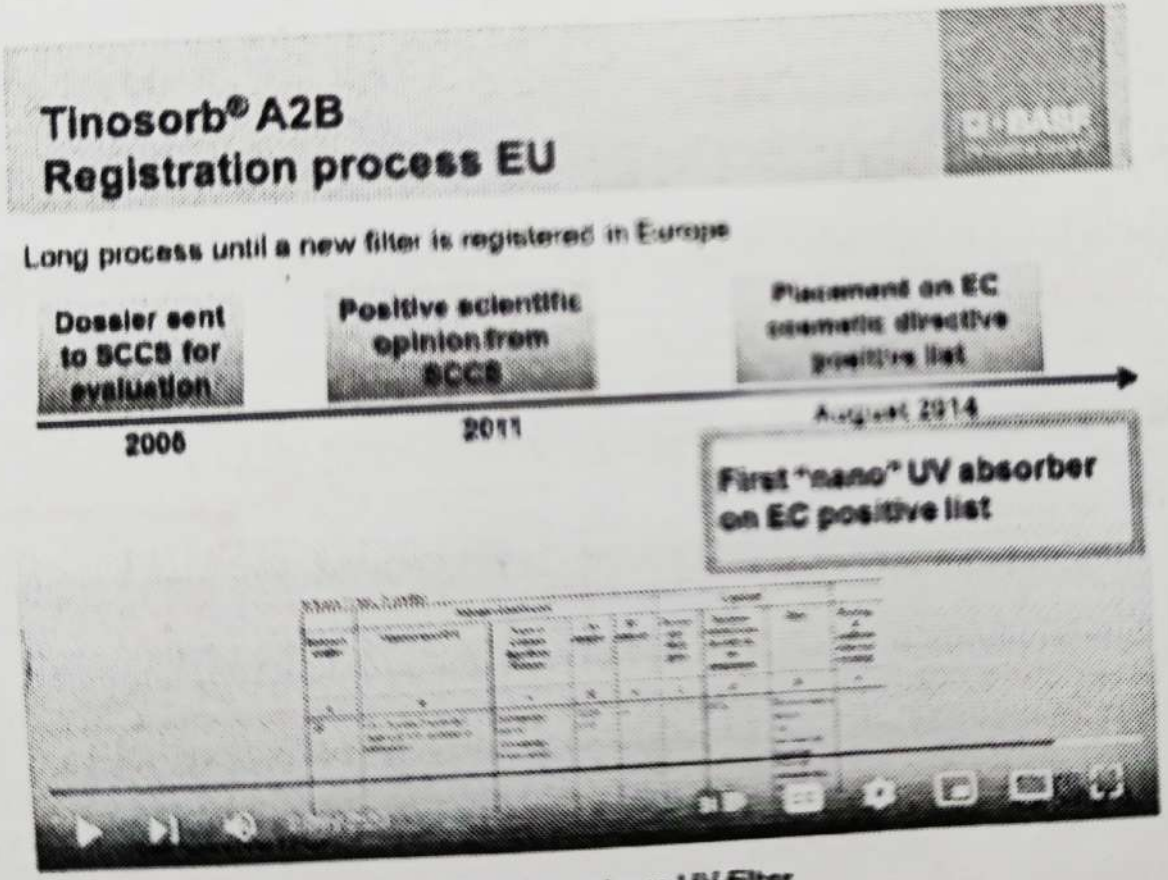
Tinosorb® A2B
Registration process EU

Long process until a new filter is registered in Europe



Tinosorb® A2B: An innovative broad-spectrum UV filter

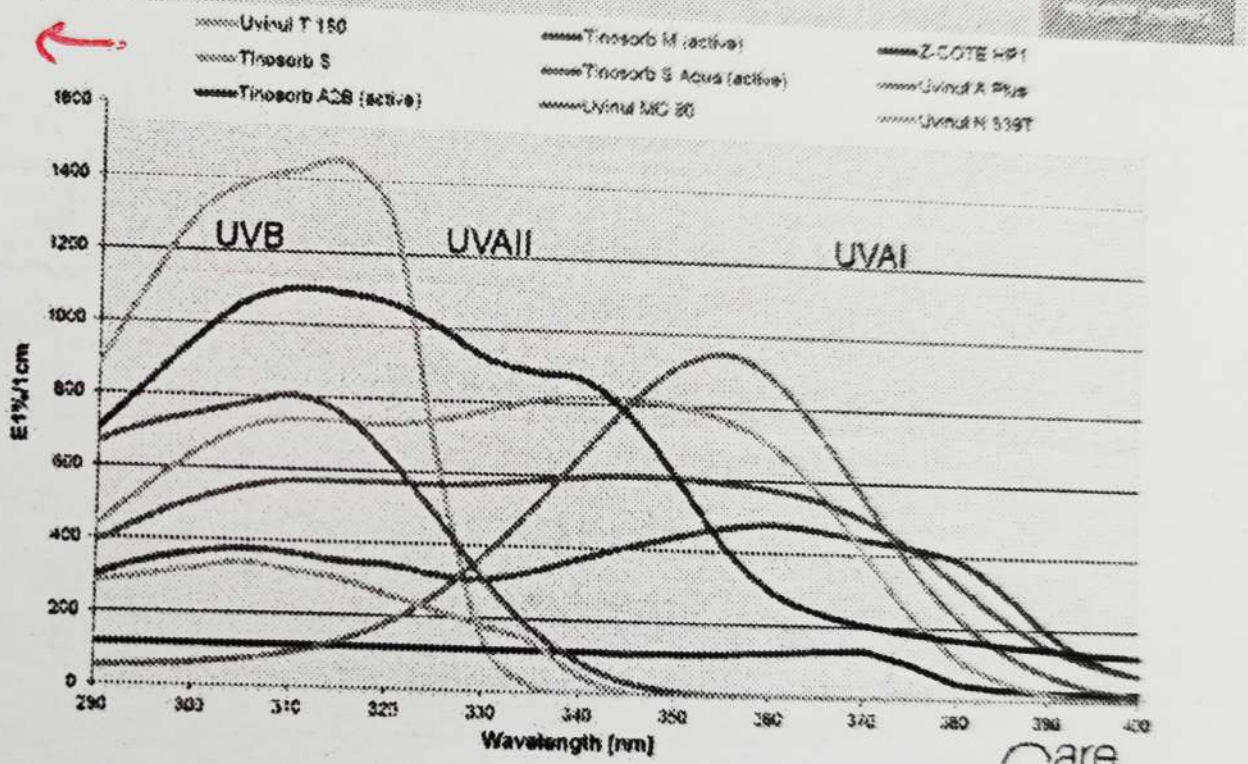
بمرار filter باجراءات
طويلة لحتى نحصل بموافقة
استخدام
هادا Tinosorb
بلشي بار ٢٠٠٥
وخلص بـ ٢٠١٤ !!



Tinosorb® A2B: An innovative broad-spectrum UV filter

يُعتبر ضمن ال
Positive list
بأوروبا ✓

UV Filter Performance
Overview



Care Creations.

في أنواع مختلفة لـ Tinosorb ←

عربتكلكم انا مثلوا كل نوع بأي UV Region موجود

وأسئ إنكم ع تتا مثلوا ☺

Sunscreen combinations

معظم واقيات الشمس بتكون combination مش agent واحد

- Many sunscreen formulations contain combination of sunscreen agents to enhance protection
- Combinations are used to achieve a higher SPF by using a lower concentration of sunscreen ingredients
- The FDA regulates which sunscreen can be combined with others
- This is because certain sunscreen ingredients are incompatible and can lower the SPF rating of a product when combined

ال combinati- بتكون بناءً على قائمة عاملتها ال FDA

- UV filters for sunscreens are regulated globally as either, over-the-counter (OTC) drugs, quasi-drugs, or cosmetics

- All countries have a positive list of UV filters, including maximum concentration allowed in sunscreens.

- In most countries, including Europe and Japan, UV absorbers are regulated as cosmetics;
- in the United States and Canada as OTC drugs;
- and in Australia as therapeutic drugs.
- The worldwide regulatory status of the UV filters is given in Table1, containing all relevant UV filters. The number of available UV filters differs from region to region.

SKIP

Table 1. Common UV filters approved in Australia (AUS), Europe (EU), Japan (JP), and United States (USA)

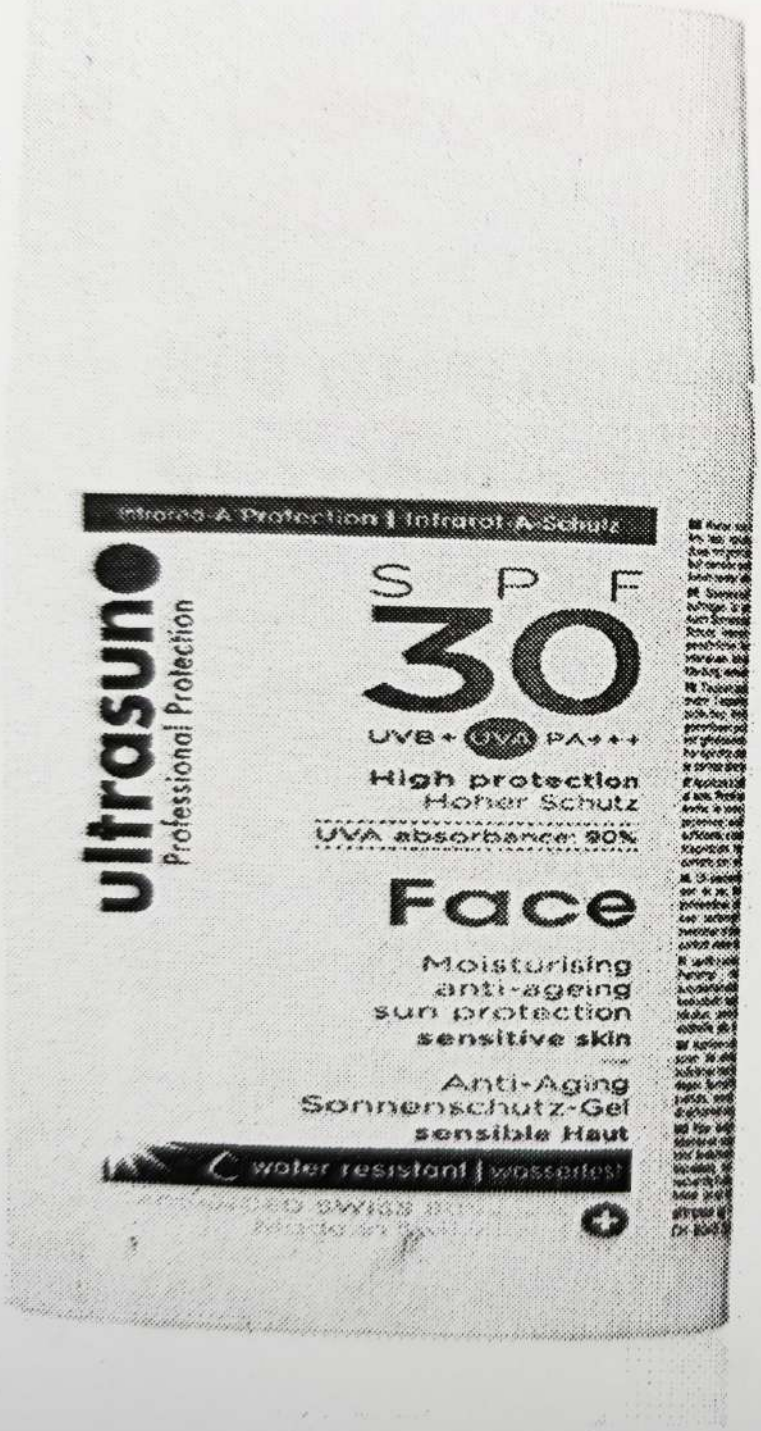
	INCI (International Nomenclature of Cosmetic Ingredients)	COLIPA (Cosmetics Europe)	USAN (United States Adopted Names)	Trademark	INCI abbreviation	Form	Concentration limits in sunscreen (%) AUS	EU	JP	USA
Broad-Spectrum and UVAI (340–400 nm)	Bis-ethylhexyloxyphenol methoxyphenyl triazine	S 81	Bemotrizinol	Tinosorb® S	BEMT	p	10	10	3	*
	Butyl methoxydibenzoylmethane	S 66	Avobenzone	Parsol® 1789	BMBM	p	5	5	10	3
	Diethylamino hydroxybenzoyl hexyl benzoate	S 83	–	Uvinul® A Plus	DHHB	p	10	10	10	–
	Disodium phenyl dibenzimidazole tetrasulfonate	S 80	Bisdisulizole Disodium	Neo Heliopan® AP	DPDT	p	10	10	–	–
	Drometrizole trisiloxane	S 73	Drometrizole Trisiloxane	Mexoryl® XL	DTS	p	15	15	–	–
	Menthyl anthranilate	–	Meradimate	–	MA	p	5	–	–	5
	Methylene bis-benzotriazolyl tetramethylbutylphenol	S 79	Bisoctrizole	Tinosorb® M (active)	MBBT	d	10	10	10	*
	Terephthalylidene dicamphor sulfonic acid	S 71	Ecamsule	Mexoryl® SX	TDSA	p	10	10	10	*,†
	Zinc oxide	S 76	Zinc Oxide	Z-Cote® HP1	ZnO	p, d	no limit	‡	no limit	25
UVB (290–320 nm) and UVAII (320–340 nm)	4-Methylbenzylidene camphor	S 60	Enzacamene	Eusolex® 6300	MBC	p	4	4	–	*
	Benzophenone-3	S 38	Oxybenzone	–	BP3	p	10	10	5	6
	Benzophenone-4	S 40	Sulisobenzone	Uvinul® MS40	BP4	p	10	5	10	10
	Polysilicone-15	S 74	–	Parsol® SLX	PS15	l	10	10	10	–
	Diethylhexyl butamido triazone	S 78	Iscotrizinol	Uvasorb® HEB	DBT	p	–	10	–	*
	Ethylhexyl dimethyl PABA	S 08	Padimate O	Eusolex® 6007	EHDP	l	8	8§	10	8
	Ethylhexyl methoxycinnamate	S 28	Octinoxate	Uvinul® MC 80	EHMC	l	10	10	20	7.5
	Ethylhexyl salicylate	S 13	Octisalate	Neo Heliopan® OS	EHS	l	5	5	10	5
	Ethylhexyl triazone	S 69	Octyltriazone	Uvinul® T150	EHT	p	5	5	3	*
	Homomenthyl salicylate	S 12	Homosalate	Eusolex® HMS	HMS	l	15	10	10	15
	Isoamyl p-methoxycinnamate	S 27	Amiloxate	Neo Heliopan® E1000	IMC	l	10	10	–	*
	Octocrylene	S 32	Octocrylene	Uvinul® N539 T	OCR	l	10	10	10	10
	Phenylbenzimidazole sulfonic acid	S 45	Ensulizole	Eusolex® 232	PBSA	p	4	8	3	4
	Titanium dioxide	S 75	Titanium Dioxide	Eusolex® T2000	TiO_2	p, d	25	25	no limit	25
	Tris biphenyl triazine	S 84	–	Tinosorb® A2B	TBPT	d	¶	¶	¶	¶

*Time and Extent Application (TEA), Proposed Rule on FDA approval expected not before 2014.
†Approved in certain formulations up to 3% via New Drug Application (NDA) Route.
‡Not yet approved in EU, positive opinion by Scientific Committee on Consumer Safety (SCCS).
§Not being supported in the EU and may be delisted.
¶Not yet approved in EU or anywhere else (but positive Safety Opinion on 1,3,5-Triazine, 2,4,6-tris[1,1'-biphenyl]-4-yl-, SCCS Sept/Dec. 2011).
Cosmetics Europe (formerly COLIPA): http://www.cosmeticseurope.eu/, order number shows chronology of UV filter development.
Trademarks: Tinosorb®, trademark of BASF SE, Ludwigshafen Germany; Parsol®, trademark of DSM, Kaiseraugst, Switzerland; Uvasorb®, trademark of 3V Sigma, Bergamo, Italy; Uvinul®, trademark of BASF SE, Ludwigshafen Germany; Neo Heliopan®, trademark of Symrise AG, Holzminden Germany; Mexoryl®, trademark of L'Oreal, Paris France; Z-Cote®, trademark of BASF SE, Ludwigshafen Germany; Eusolex®, trademark of Merck, Darmstadt Germany.
p, powder; l, liquid; d, dispersion.

Photodermatol Photoimmunol Photomed 2014; 30: 63–80

Currently the approved UVA1 filter in USA are:

1. Zinc Oxide
2. Avobenzone
3. Mexoryl SX


UVB-A Protection | Infrarot-A-Schutz
ultrasun
Professional Protection
SPF
30
UVB+ UVA PA+++
High protection
Hoher Schutz
UVA absorbance: 90%
Face
Moisturising
anti-ageing
sun protection
sensitive skin
Anti-Aging
Sonnenschutz-Gel
sensible Haut
water resistant | wasserfest


sun protection
sensitive skin
with antioxidants and Ectoin*
water resistant
NO
perfume, mineral oils,
PEG/PPG emulsifiers, silicones,
preservatives, octocrylene,
ethylhexyl methoxycinnamate
ADVANCED SWISS SUNCARE
Made in Switzerland
e 50 ml

Combination

Filters

- Ingredients: Aqua, Caprylic/Capric Triglyceride, Pentylene Glycol, Methylene Bis-Benzotriazolyl Tetramethylbutylphenol (Nano), Titanium Dioxide (Nano), Ethylhexyl Salicylate, Glycerin, Bis-Ethylhexyloxyphenol Methoxyphenyl Triazine, C12-15 Alkyl Benzoate, Diethylamino Hydroxybenzoyl Hexyl Benzoate, Ethylhexyl Triazone, C8-22 Alkyl Acrylates/Methacrylic Acid Crosspolymer, Polyacrylate Crosspolymer-6, Squalane, Ectoin, Cocoglycerides, Hydrogenated Phosphatidylcholine, Vitis Vinifera Seed Extract, Decyl Glucoside, Silica, Propyl Alcohol, Alcchol, Cetyl Phosphate, Xanthan Gum, Propylene Glycol, T-Butyl Alcohol, Lecithin, Tocopheryl Acetate, Ascorbyl Tetraisopalmitate, Tocopherol, Diisopropyl Adipate, Ubiquinone.

Sensitive Skin:

- If you're in the US, avobenzone is in almost all broad spectrum organic sunscreens (except for the ones containing L'Oreal's patented Mexoryl SX). Avobenzone is a common irritant and allergen, so it tends to be unsuitable for sensitive skin, and you're left with inorganic sunscreens only.
- If you're elsewhere in the world, the newer UVA1 filters aren't particularly irritating or allergenic.
- A few other organic sunscreens also tend to cause allergic and irritant reactions: octocrylene, oxybenzone, avobenzone, PABA, Padimate O and enzacamene.

مشكلة واضحة ! الشمس بتعمل تهيج بالعيون خاصة إذا كانت نوعه ضد المي

- Sunscreen actives cause irritation to the eyes. When a water-resistant sunscreen enters the eye, the water-resistant agents adhere to the mucus membrane of the eye

بدخل للعين وبلتصق بالغشاء فترة طويلة وبيعمل تهيج

- This holds the sunscreen actives in place causing sever and prolonged irritation

Vehicle for delivery of sunscreen ingredients

- **Lotion and creams:**
  - **Lotion:**

Normal to oily skin
Have lower viscosity
Spread more easily
Less greasy

  - **Cream:**

Dry skin

- **Gels:**

Male patients
Oily skin
Water-based gels are more appropriate than alcohol based gels

- **Sticks:**

Lipid-soluble sunscreen ingredients are contained in sticks
Waxes and petrolatum are added to thicken the formulations
Effective for narrow and prominent areas such as the lips, ears, nose and around the eyes
Superior for use during exercise and water activities (i.e. last longer and do not have the tendency to melt which can irritate the eyes)

Blocks of UV.

نهار السلايد في علاقة بين نسبة ال SPF وال

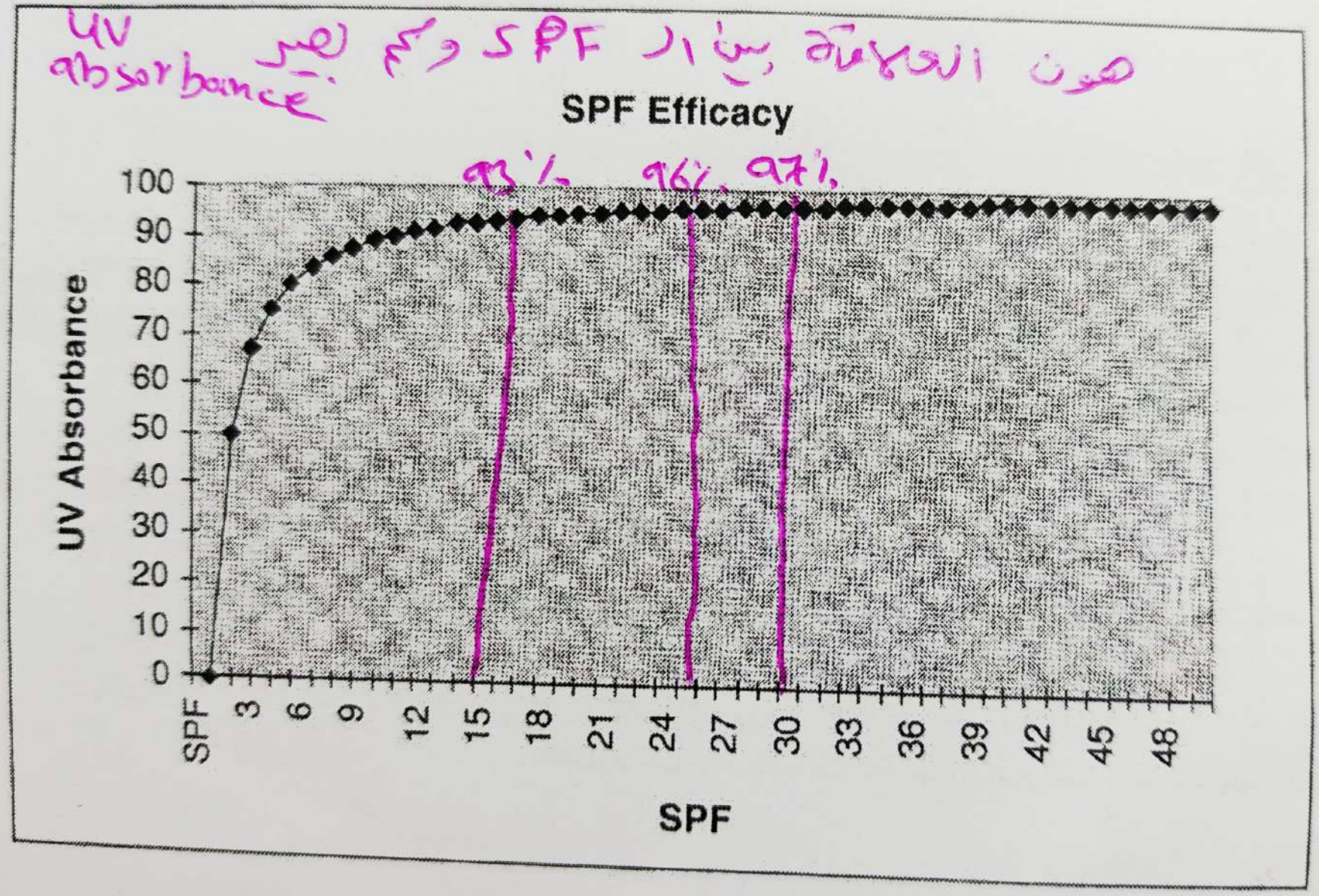
FDA Sunscreen Monograph

- 50+ → maximum SPF allowed on sunscreen package
- A sunscreen with SPF 15 blocks about 93% of UVB radiation
- A sunscreen with SPF 30 blocks 97% of UVB radiation
- An SPF 25 blocks 96% of the sunburn response
- An SPF 50 only blocks 2% more (98%)
- Very high SPF products are more expensive, may be more irritating to skin & eyes, and offer little extra protection for the average consumer

ممنوع نكتب اكثر من 50.

كل ما زادت نسبة ال SPF بصير أغلى ويعمل irritation بالبشرة والعين وبعطي حماية أكثر.

Figure 1. SPF Efficacy Versus % UV Absorbance



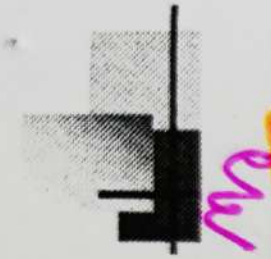


Table 3. FDA Accepted Sunscreen Actives

INCI Name	Max. Conc.	Protection Range	Trade Name(s)	Selected Supplier(s)
PABA	15%	UVB	PABA	Rona
Avobenzone	3%	UVA	Parsol 1789	Roche
Cinoxate	3%		None	None
Dioxybenzone	3%	UVA	Benzophenone-8	American Cyanamid
Homosalate	15%	UVB	HMS	Rona
Menthyl anthranilate	5%	UVA	Neo Heliopan MA	Haarman & Reimer
Octocrylene	10%	UVB/UVA	Excalol 597	ISP Van Dyke
Octyl methoxycinnamate	7.50%	UVB	Parsol MCX Escalol 557	Roche ISP Van Dyk
Octyl salicylate	5%	UVB	Escalol 587	ISP Van Dyk
Oxybenzone	6%	UVA	Neo Heliopan BB	Haarman & Reimer
Padimate O	8%	UVB	Escalol 507	ISP Van Dyk
Phenylbenzimidazole sulfonic acid	4%	UVB	Eusolex 232 Parsol HS	Rona Roche
Sulisobenzone	10%		UMS 40	BASF
Titanium dioxide	25%	UVB/UVA		Kobo
Trolamine salicylate	12%	UVB	None	None
Zinc oxide	25%	UVB/UVA		Kobo Sunsmart

ما في داعي نحط exp date عواقي الشمس في حال
إنه كان stable لمدة ٣ سنوات

- Expiration dates are not required on sunscreen labels if the products are stable for three years
- The term "sunblock" is not allowed on labels

ما في إشي بيعمل block بالـ
ف غير مسموح استخدامها .
لإنه الشمس عبالج عن wide wave length .

مسموحلي تكتب عالمنتج إنه UV Protection ، كاليش ؟

- Assessment of UVA protection should be related to the SPF as the major claim on sunscreens, as recommended by the European commission, stating that UVA-PF/SPF≥1/3. ①

Protection factor

- Other UVA categories such as the Boots 5-star rating with a UVA/UVB ratio>0.9 go beyond the EU recommendation. ②

بياخذ خمس نجوم إذا كانت النسبة أكبر ٠,٩

حسب توصيات اوروبا طبقًا

How will consumers know how much UVA protection a sunscreen provides?

the proposed UVA rating system:

- One star will represent low UVA protection
- Two stars, medium protection
- Three stars, high protection
- Four stars, the highest UVA protection available in an over-the-counter (OTC) sunscreen product.
- If a sunscreen product does not rate at least one star, FDA is proposing that its labeling bear a "no UVA protection" marking on the front label, near the SPF value.

- In USA, sunscreens are considered an OTC drug
- Required by law to prove efficacy
- Sunscreen formulation is both an art and a science
- It is not simply an emulsion system with sunscreen actives included in the formulation
- Formulation greatly influences the efficacy of the sunscreen actives

حكينا بواقيات الشمس ما بقدر أحدد أنا شبهة الحماية بناءً على تركيز تركيبة عليه .

الأشياء اللي بتأثر على قيمة الـ SPF

- The SPF is influenced by the type of sunscreen actives, (1) the emulsion's oil phase, (2) the emulsion water phase, (3) the emulsification process. (4)
- A chemical sunscreen active protect the skin by absorbing the UV radiation and transforming it into less damaging radiation such as heat and light
- They might also generate free radicals in response to UV radiation
- For both to occur the sunscreen active must maintain a high concentration in the SC for several hours

حكينا الـ chemical بتحمي الـ skin من الـ UV عن طريق
إنه بتحول لـ heat و light
في نفس الوقت عندي مشكلة
free radicals.

هدف تصنيع الـ sunscreen

- The goal of the formulator is to develop the highest SPF possible using the least amount of sunscreen actives, because sunscreen actives are expensive and may be irritating

(١)

تحقيق نسبة عالية من الـ SPF
باستخدام اقل الكميات الممكنة
حتى ما يكون غالية + ما يكون irritant .

Formula 1. Sunscreen Lotion (SPF 30), from ISP Van Dyk

Ingredient Type	Wt %
A. Water *(aqua)*	50.40
Xanthan gum	1.00
B. Glyceryl stearate (and) laureth-23	6.00
PEG-20 stearate	3.00
Cetyl lactate	3.00
C12-15 alkyl lactate	1.00
Myristyl myristate	4.00
Octyl methoxycinnamate	7.50
Benzophenone-3	3.00
Octyl salicylate	3.00
Propylene glycol	6.00
C. Titanium dioxide, ultra fine	5.00
Isocetyl stearoyl stearate	3.00
Maleated soybean oil	3.00
D. Preservative	1.00
E. Fragrance *(parfum)*	0.10
	100.00

Procedure

Mix C with a roller mill. Disperse A with high speed mixing. Heat to 75°C. Heat B to 80°C and add C. Add BC to A. Mix with homogenizer for 15 minutes. Mix while cooling to 40°C with a sweep blade. Add D and then E. Mix while cooling to 25°C.

- Terms such as sunblock, waterproof and sunproof are not allowed → misleading

مصطلحات مثل كلمة
وممنوع استخدامها

PHYSICAL VS CHEMICAL SUNSCREENS
PROTECTION LEVEL

- SPF 50+ is common with both types of sunscreen
- Organic sunscreens give higher, photostable protection from UVA if you use newer filters like Tinosorbs S and M.

مقارنة
ميزات كل واحد

- Avobenzone also gives high UVA protection, but it breaks down in UV so you have to reapply every 2-4 hours (although some formulas stabilize avobenzone so it breaks down slower).

نصيحة الدكتورة استخدم واقي الشمس
اللي بترتاح باستخدامه ومناسب إلك.

broad spectrum protection (includes protection against longer UVA wavelength)

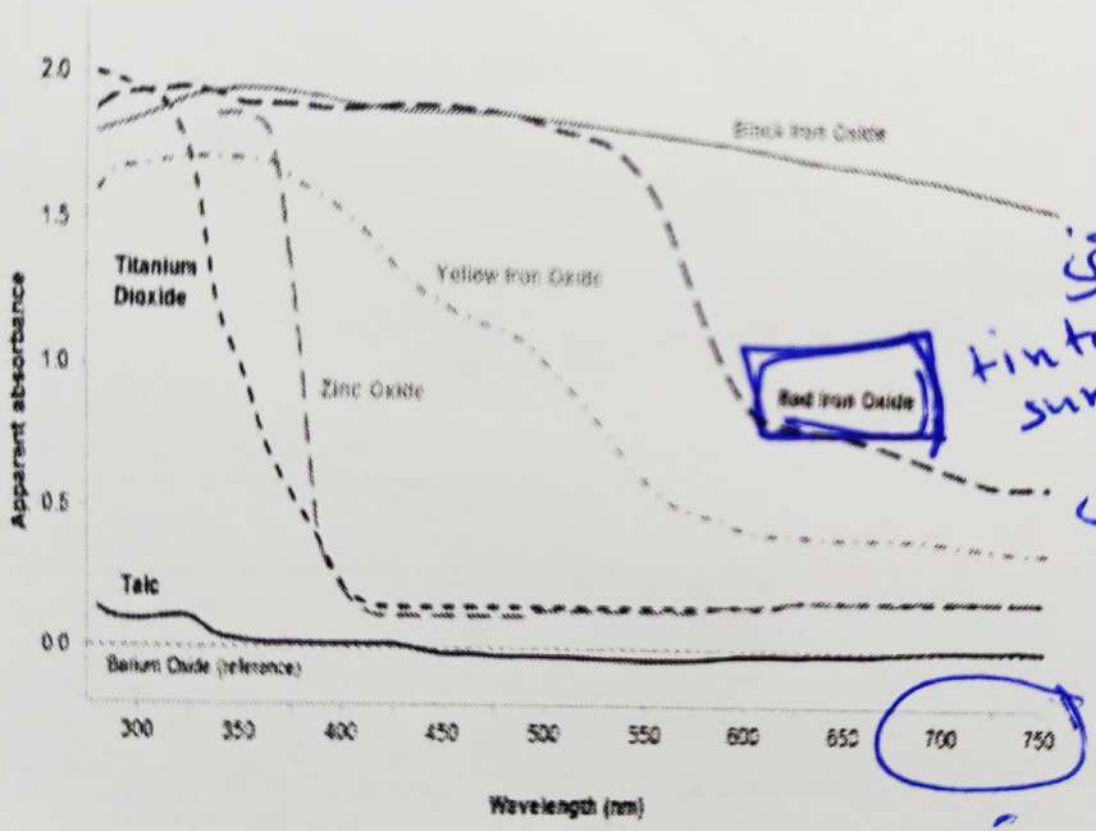


Fig. 4. Absorption of inorganic UV filters (reference barium oxide, dashed line).

Photodermatol Photoimmunol Photomed 2014; 30: 62–80

مستخدمة في tinted sun screen بتعطي طبقة من الفاونديشن مع لون الجلد

امتصاص ال visible light

PHYSICAL VS CHEMICAL SUNSCREENS WHITE CAST

chemical

- Organic sunscreens leave less white cast

physical

- inorganic sunscreens tend to leave white cast.

تتعمل طبقة بيضا عالوجه
بسبب وجود ال
$ZnO + TiO_2$

متى أجدد واقي الشمس؟

Why you need to reapply?

1. The sunscreen is being removed by daily activities
2. The film thins out
3. Photodegredation (for some sunscreen ingredients)

صب الـ formula

صب الأنشطة اليومية والتعرق

إذا stable أو لا.

SKIP

- Sunscreen regulations in the world from European Union, USA, Canada to China (cosmeticsdesign-europe.com)
- EU SPF Regulations: What's required for product claims and labels? (ulprospector.com)

Done By Mariam Yacoub.