
Technical Information

ME 266 e
(974) August 1995 (MPM)

Register 20

Uvinul[®] grades

UV absorbers for cosmetic products

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Chemical nature

The Uvinul products are LJV filters based on benzophenones, diphenyl cyanoacrylate, triazine or p-aminobenzoic acid.

Range

	CTFA name	GAS number
Uvinul M 40	Benzophenone-3	131-57-7
Uvinul MS 40	Benzophenone-4	4065-45-6
Uvinul D 50	Benzophenone-2	131-55-5
Uvinul D 49	Benzophenone-6	131-54-4
Uvinul DS 49	Benzophenone-9	3121-60-6
Uvinul 400	Benzophenone-1	131-56-6
Uvinul M 493	Benzophenone-n	1341-54-4
Uvinul N 539	Octocrylene	6197-30-4
Uvinul P 25	PEG-25 PABA	113010-52-9
Uvinul T 150	Octyl Triazone	88122-99-0

Table 1

Properties	Soluble Water	in Oils	UV ban UV-A	d UV-B	AppliCc Sun care	itions Antiphoto- oxidation
Uvinul M 40		x	x	x	x	x
Uvinul MS 40	x		x	x	x	x
Uvinul D 50		x	xx	x	x	x
Uvinul D 49		x	xx	x	x	x
Uvinul DS 49	x		xx	x		x
Uvinul 400		x	x	XX		x
Uvinul M 493		x	XX	x		x
Uvinul N 539		Miscible		x	x	x
Uvinul P 25	x			x	x	x
Uvinul T 150		x		XX	x	x

Applications

The Uvinul UV filters are used in a large number of cosmetics to protect the skin, the product, particularly the colorant, the fragrance or the active ingredient, and to protect the hair against the damaging effects of UV radiation.

Some of the Uvinul grades are typical UV-B absorbers, i.e. their absorption maximum lies in the 280-320 nm band. The majority of the Uvinul types, particularly the benzophenone derivatives are broad-band filters, i.e. they absorb both in the UV-A (320-400 nm) and in the UV-B (280-320 nm) range (see Table 1). All the Uvinul types have very good stability to light.

As both oil-soluble and water-soluble types are available, there is a grade for almost every cosmetic preparation, including emulsions, oils, gels, eau de toilette, lipsticks, nail varnish etc. (see Tables 3 and 4 for solubilities).

Use in skin protection

UV radiation is responsible for various physiological effects in the skin, as a result of its high energy content. These effects include sunburn, the premature appearance of folds, i.e. accelerated aging of the skin and, with frequent intensive irradiation, an increased risk of skin cancer. UV filters provide vital protection for the skin against these damaging effects of UV radiation. Apart from sun preparations, they are now also increasingly being used in other skin cosmetics such as day creams. The use of UV filters to protect the skin is subject to legislation in many countries. Table 2 shows the approval status and the permitted concentrations in the EC, USA and Japan. The concentrations of UV filters in sun preparations depend on the desired degree of protection, measured in terms of the sun protection factor (SPF). To achieve a high SPF in emulsion preparations, it is necessary to use UV filters both in the oil phase and in the water phase. Day creams usually use broad-band filters or UV-A filters. UvinulM 40 is therefore particularly suitable for these products.

Approval status

Table 2

	EC	USA	Japan
Uvinul M 40	+(10%)	+(2- 6%)	+(5%)
Uvinul MS 40	+(5%)	+(5-10%)	+
Uvinul D 49	—	—	+
Uvinul DS 49	—	—	+
Uvinul D 50		---	+
Uvinul 400			+
Uvinul N 539	+(10%)	+(7-10%)	---
Uvinul P 25	+(10%)	---	---
Uvinul T 150	+(5%)	—	—

+ = Provisionally or finally approved as a sunscreen agent
(with max. concentration)

- = Not approved

In the EC, cosmetics that contain more than 0.5% UvinulM 40 for skin protection must be marked, "Contains oxybenzone".

Use in protecting sensitive products

UV filters can be used in cosmetics to protect the colorants against fading, to improve the stability of fragrance oils and active constituents against oxidation and to stabilize the viscosity of gels and shampoos. It is always necessary to add a UV filter if the cosmetic product is exposed to UV radiation, as is the case when the packaging is transparent. The protection of products usually requires lower concentrations than skin protection, viz. 0.05-0.5%. In these concentrations, the Uvinul grades are generally not controlled by legislation (though such legislation as exists must be observed), i.e. all the Uvinul grades can, in principle, be used to protect products against UV radiation.

Particularly the broad-band UV filters, Uvinul D 50, M 40, D 49, M 493 and 400 have proved effective in protecting colorants against fading, though their efficiency depends on the colorant and on the medium in which it is used.

Although we can supply detailed results of tests on request, it is recommended that users conduct their own tests on the final products.

Use in protecting the hair

Both the ultraviolet and visible components of sunlight have tangible effects on the hair in that it becomes bleached and brittle. As has been demonstrated in studies, it is possible to provide protection against these effects with UV filters.

Broad band filters such as the benzophenones are particularly suitable and can be used in hair-care products such as gels, setting lotions, normal and gloss hair sprays.

The specifications are given on separate data sheets that are updated continuously.

Specifications

Table 3

Physicochemical properties of the Uvinul grades			
	Molecular formula	Molecular weight	Appearance
Uvinul M 40	$C_{14}H_{12}O_3$	228	Light yellow powder
Uvinul MS 40	$C_{14}H_{12}O_6S$	308	Light yellow powder
Uvinul D 50	$C_{13}H_{10}O_5$	246	Yellow powder
Uvinul D 49	$C_{15}H_{14}O_5$	274	Yellow powder
Uvinul DS 49	$C_{15}H_{12}O_{11}Na_2$	478	Yellow powder
Uvinul 400	$C_{13}H_{10}O_3$	214	Yellowish powder
Uvinul M 493	---	---	Yellow powder
Uvinul N 539	$C_{24}H_{27}NO_2$	361	Clear yellow viscous liquid
Uvinul P 25	$C_{59}H_{111}NO_{27}$	ca. 1265	Light yellow wax that becomes liquid and clear at 30-40 °C
Uvinul T 150	$C_{48}H_{66}N_6O_6$	823	Off-white to pale yellow powder

Oil-soluble UV filters
Solubility in % at 20 °C

Table 4

	Ethanol	Propylene glycol	Luvitol® EHO	IPM	Liquid paraffin	Miglyol® 812
Uvinul M 40	ca. 6	ca. 1	ca. 7	ca. 12	ca. 1.5	ca. 15
Uvinul D 50	ca. 50	ca. 38	ca. 3	ca. 8	<0.01	ca. 8.0
Uvinul D 49	ca. 1	ca. 1	ca. 1	ca. 1	<1.0	ca. 2
Uvinul M 493	ca. 2.5	ca. 2.5	ca. 2.5	ca. 2.5	<0.01	ca. 2
Uvinul N 539	Miscible	-	Miscible	Miscible	-	Miscible
Uvinul T 150	ca. 1	<1	ca. 1	ca. 3	<1	ca. 4
Uvinul 400	ca. 41	ca. 15	ca. 2	ca. 5	<0.01	ca. 5

Water-soluble UV filters
Solubility in % at 20 °C

Table 5

	Water	Ethanol	Propylene glycol
Uvinul MS 40 (neutralized with TEA)	ca. 34	ca. 2	ca. 15
Uvinul DS 49	ca. 5	< 0.01	ca. 1
Uvinul P 25	Miscible	Miscible	Miscible

Uvinul M 40

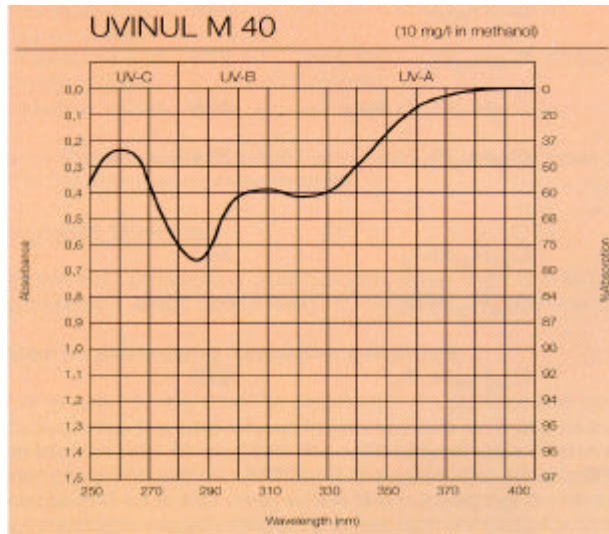
Structure



Chemical name

2-Hydroxy-4-methoxybenzophenone

UV spectrum



Properties and applications

As Uvinul M 40 is approved for skin care in the EC, the USA and Japan, it is widely used in sun preparations. Uvinul M 40 is a broad-band filter and can therefore also be used in day creams to prevent premature aging of the skin and to protect the lips.

As it is soluble in oil, Uvinul M 40 is incorporated in the oily phase. Its solubility in different oils is shown in the table below and in Table 4.

Polar oils such as Luvitol EHO, isopropyl myristate, Miglyol® 812, Finsolv® TN, Citroflex® and Cetiol® HE are particularly suitable.

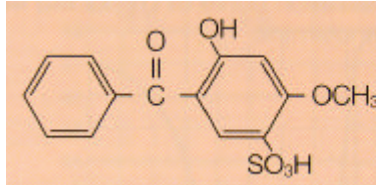
Non-polar oils such as liquid paraffin are less suitable, as Uvinul M 40 can crystallize out as a result of supersaturation after prolonged storage.

Table 6: Solubility of Uvinul M 40 in different oils

Glycerol (8)	<	0.01 %
Abil® AV 8853 (15)	ca.	2.0%
Jjoba oil	ca.	6.0%
Isostearylstearyl stearate (16)	ca.	7.0%
Isostearyl neopentanoate (17)	ca.	8.0%
Olive oil	ca.	9.0%
Peanut oil	ca.	9.0%
Cetiol® V (11)	ca.	9.0%
Isopropyl stearate (11)	ca.	9.0%
Isopropyl myristate (11)	ca.	11.0%
Miglyol® 812 (6)	ca.	14.0%
Finsolv® TN (9)	ca.	15.0%
Cetiol HE (11)	ca.	17.0%
Citroflex® 2 (13)	>	20.0%

Uvinul MS 40

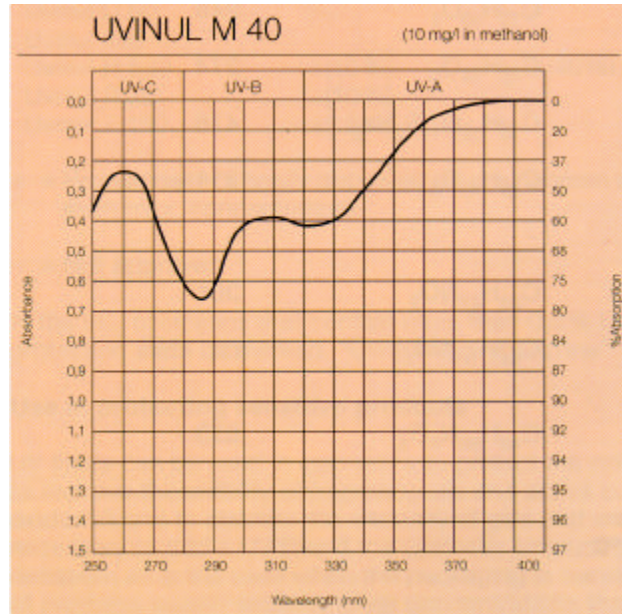
Structure



2-Hydroxy-4-methoxybenzophenone-5-sulfonic acid

Chemical name

UV spectrum



Properties and applications

The sulfonic acid group makes Uvinul MS 40 soluble in water. The acid group must be neutralized with one of the usual neutralizing agents, e.g. triethanolamine, NaOH etc. It must be noted that the neutralizing agent can affect the UV absorption characteristics.

The quantities of neutralizing agent required to completely neutralize 100g of Uvinul MS 40 are as follows:

NaOH	ca. 13.0 g
TEA	ca. 50 g

The pH value of the resultant solutions lies between 5.6 and 6.

Fig. 1 shows a neutralization curve for TEA.

Neutralization curve of Uvinul MS 40 (100 g of a 2% solution) with triethanolamine

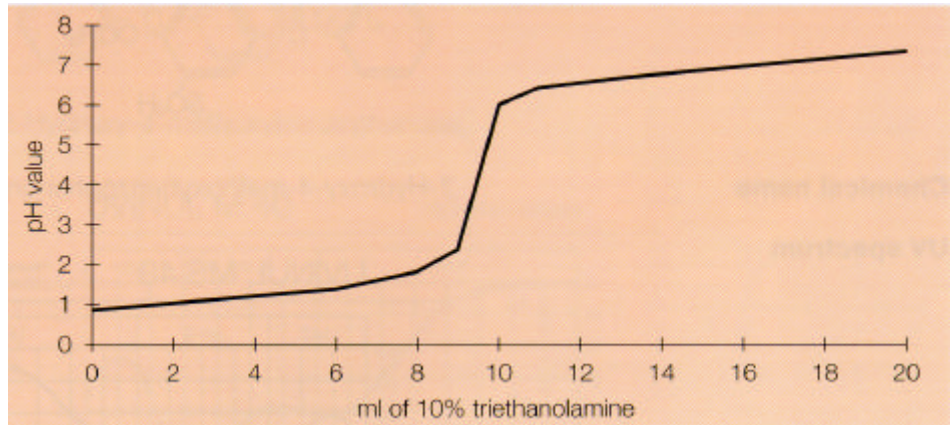


Fig. 1

As Uvinul MS 40 is approved in the EC, the USA and Japan for skin protection, it is widely used in sun preparations.

A combination of an oil-soluble UV filter, e.g. Uvinul M 40 and a water-soluble UV filter, e.g. Uvinul MS 40 gives the highest sun-protection (factors).

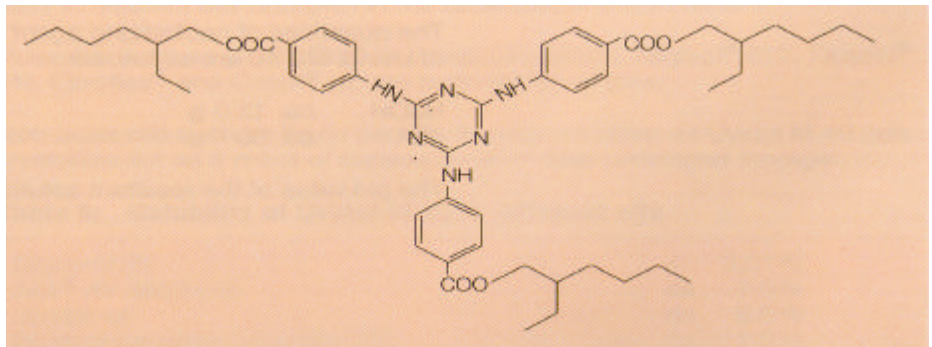
Investigations have shown that Uvinul MS 40 stabilizes the viscosity of gels based on polyacrylic acid (Carbopol[®], Acrisint[®]) when they are exposed to UV radiation. Concentrations as low as 0.1 % provide good results.

It must be noted that Uvinul MS 40 is not compatible with Mg salts, particularly in W/O emulsions.

As Uvinul MS 40 has a yellow colour, which is intensified by neutralization, it may alter the hue of coloured solutions.

Uvinul T 150

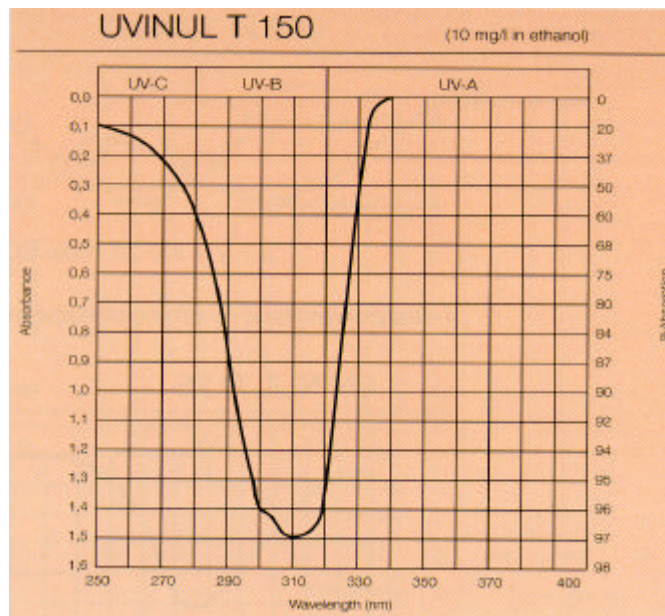
Structure



Chemical name

2,4,6-Trianiino-p-(carbo-2'-ethylhexyl-1'-oxy)-1,3,5-triazine

UV spectrum



Properties and applications

Uvinul T 150 is a highly effective UV-B filter with an absorptivity of $> 1,500$ at 312 nm. Because of its high $A_{1\text{cm}}^{1\%}$ value, only small concentrations are required in cosmetic sun-care preparations, to achieve a high SPF value. Concentrations up to 5% are recommended.

The polar nature of Uvinul T 150 gives it good affinity to the keratin in the skin, so that formulations in which it is used are particularly water-resistant. This property is further enhanced by its complete insolubility in water. As the table of solubilities shows, Uvinul 150 dissolves readily in polar oils such as Cetiol HE, Citroflex 2, Miglyol 812, diisopropyl adipate and Witconol. Non-polar oils such as liquid paraffin are unsuitable; Uvinul T 150 can crystallize out after prolonged storage, as a result of over-saturation.

Uvinul T 150 is also very stable towards light. It remains practically unchanged, even when it is exposed to intense radiation.

Uvinul T 150 is usually dissolved in the oily phase of emulsions.

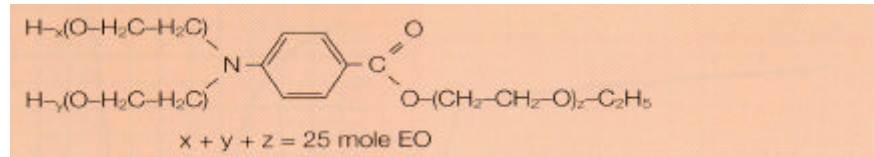
Table 7

The solubility of Uvinul T 150 in different oils (see also Table 3)

Witconol® (18) (PPG-3 myristyl ether)	ca. 13 %
Cetiol® HE (11)	ca. 10 %
(Polyot-fatty acid ester)	
Diisopropyl adipate (7)	ca. 9 %
Citroflex® 2 (13)	ca. 8 %
(Triethyl citrate)	
Miglyol® 812 (6)	ca. 4 %
Caprylic/capric acid triglycerides	
Finsolv® TN (9)	ca. 4 %
(C ₁₂ C ₁₅ -alcohol benzoate)	
Isopropyl myristate (11)	ca. 3.5 %
Isopropyl palmitate (11)	ca. 2 %
Cetiol V (11)	ca. 1.5 %
(Oleic acid decyl ester)	
Cetiol SN (11)	ca. 1 %
(Fatty acid ester + C ₁₆ C ₁₇ fatty alcohols)	
Luvitol® EHO (1)	ca. 1 %
(2-Ethylhexanoic acid cetylstearyl ester)	
Olive oil	ca. 1 %
Peanut oil	ca. 1 %
Jobba oil	< 1 %
Propylene glycol (1)	< 1 %
Liquid paraffin	< 1 %

Uvinul P 25
(formerly Lusantan 25)

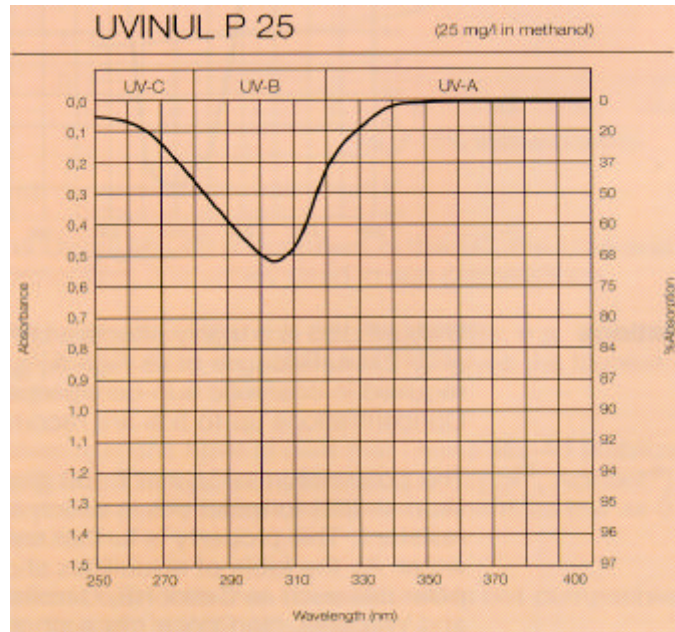
Structure



Chemical name

4-Bis(polyethoxy)-p-aminobenzoic acid polyethoxyethyl ester

UV spectrum



Properties and applications

Uvinul P 25 is used in skin cosmetics that need a water-soluble UV-B filter.

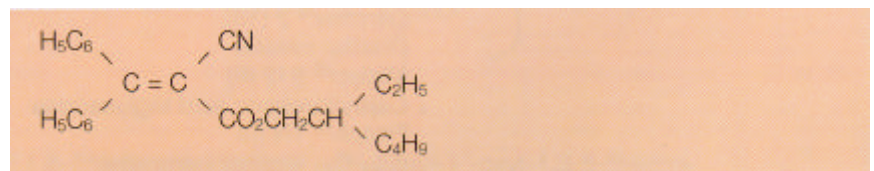
Its good solubility in water is a result of the high ethylene oxide content in the molecule. This is also the reason why it readily forms emulsions and is mild to the skin - important features of Uvinul P 25.

Its nonionic nature makes it possible to incorporate it in relatively labile emulsion systems.

Uvinul P 25 is stable in aqueous solutions, however, the presence of strong acids and bases must be avoided to prevent the possible saponification of its ester components.

Uvinul N 539

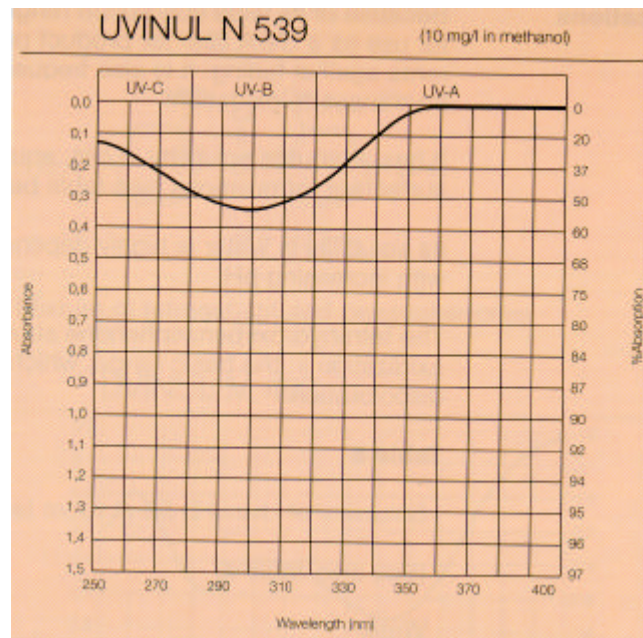
Structure



Chemical name

2-Cyano-3,3-diphenylacrylic acid 2'-ethylhexyl ester

UV spectrum

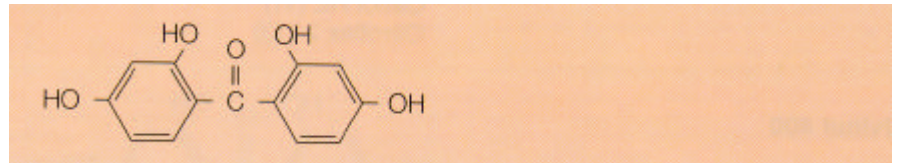


Properties and applications

Uvinul N 539 is an oil-soluble UV-B filter that is approved for use in sun-care preparations in certain countries, e.g. the USA. As it is miscible with many cosmetic oils, it can readily be incorporated in the oily phase of emulsions. Because of its hydrophobia nature and its solubility in oil, it is particularly suitable for water-repellent and water-resistant formulations. It can be combined with other oil-soluble UV filters such as UvinuM 40 to give products with a high SPF. Uvinul N 539 also has excellent stability to light.

Uvinul D 50

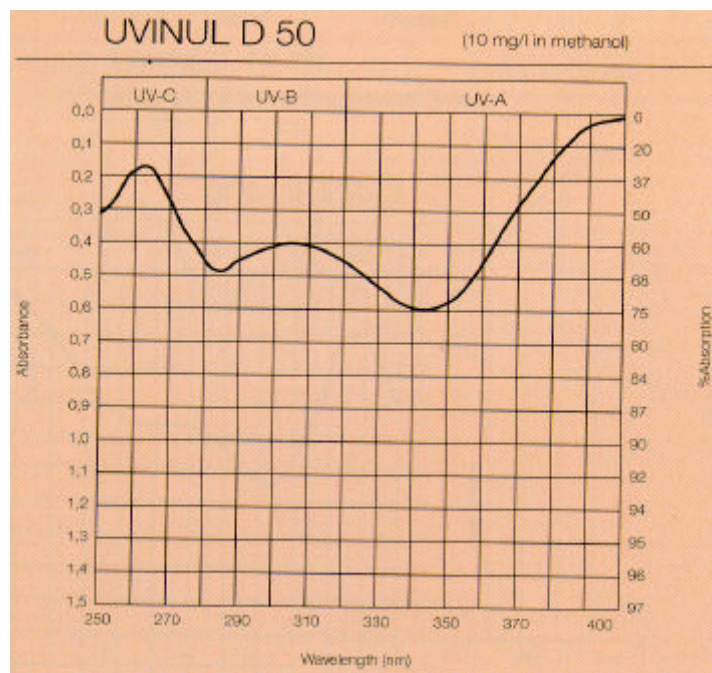
Structure



Chemical name

2,2',4,4'-Tetrahydroxybenzophenone

UV spectrum



Properties and applications

Because of its wide absorption range, Uvinul D 50 is particularly suitable for use as a UV-A filter for product protection, particularly to protect colorants against fading. It is also frequently used to improve the stability of fragrances to oxidation.

It has adequate solubility in oils, aqueous/alcoholic solutions and surfactant formulations (see table below and Table 4).

Its solubility in water is highly dependent on the pH value and increases with increasing pH.

The tetrahydroxybenzophenone structure is particularly sensitive to oxidation in the basic range, which becomes evident in a brown discoloration.

Table 8

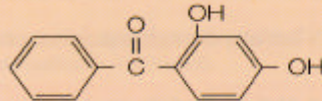
Solubility of Uvinul D 50 at room temperature

(See also Table 4)

Water	<	1 %
Olive oil	ca.	2.0%
Peanut oil	ca.	2.0%
Cetiol SN deo (11)	ca.	3.0%
Isostearyl neopentanoate	ca.	4.0%
CetiolV(U)	ca.	4.0%
Isostearylstearyl stearate (16)	ca.	5.0%
Finsolv TN (9)	ca.	5.0%
Isopropyl stearate (11)	ca.	6.0%
Isopropyl palmitate (11)	ca.	6.0%
Isopropyl myristate (11)	ca.	8.0%
Miglyol 812 (6)	ca.	8.0%
Glycerol (8)	ca.	11.0%
Cetiol HE (11)	ca.	13.0%

Uvinul 400

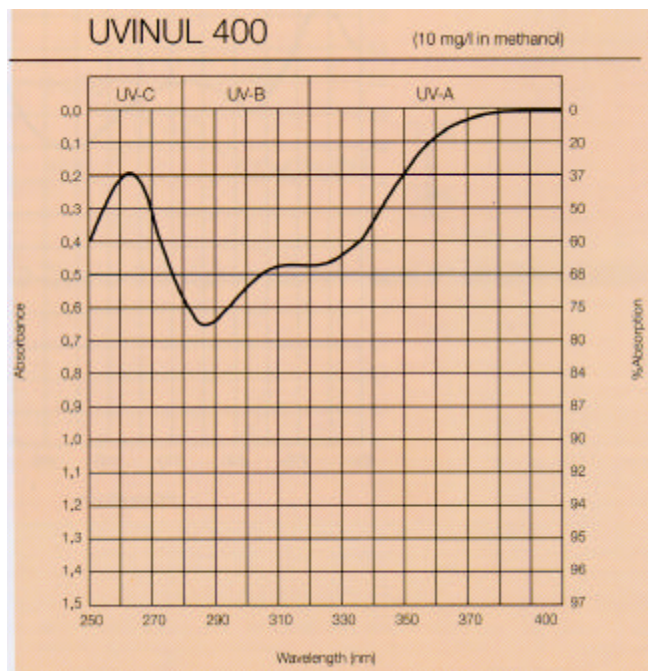
Structure



Chemical name

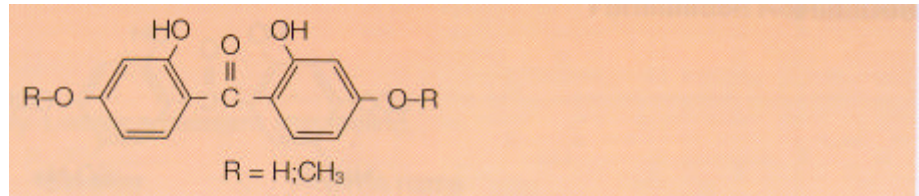
2,4-Dihydroxybenzophenone

UV spectrum



Uvinul M 493

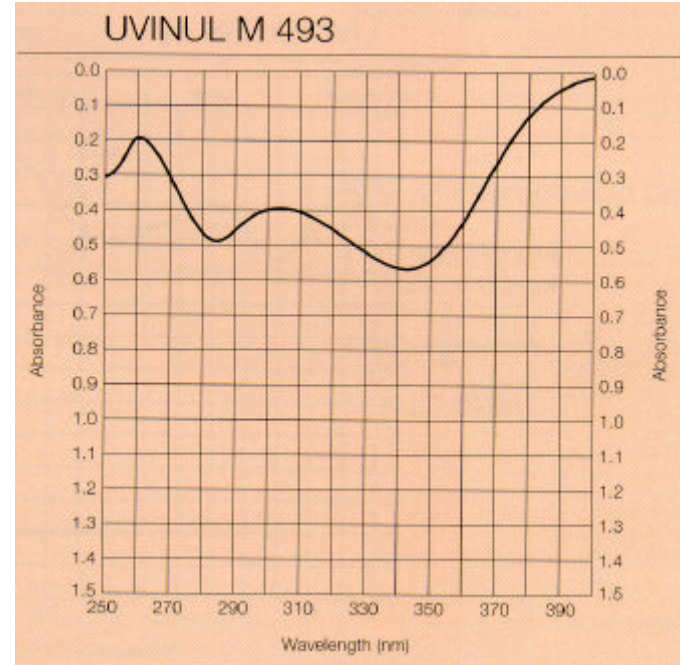
Structure



Chemical name

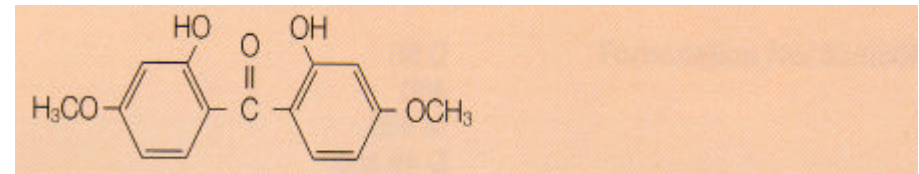
Mixture of tetrasubstituted benzophenones

UV spectrum



Uvinul D 49

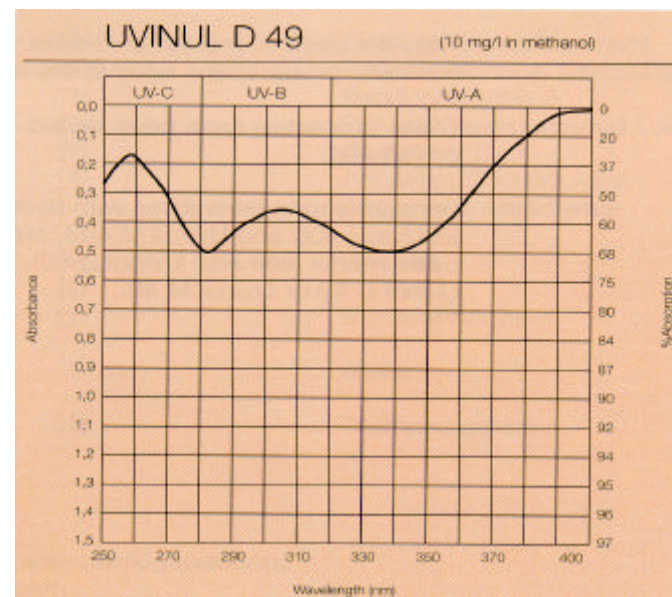
Structure



Chemical name

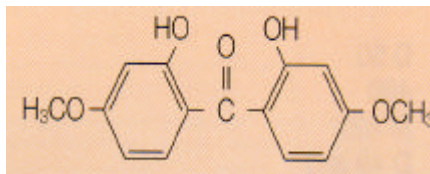
2,2'-Dihydroxy-4,4'-dimethoxybenzophenone

UV spectrum



Uvinul DS 49

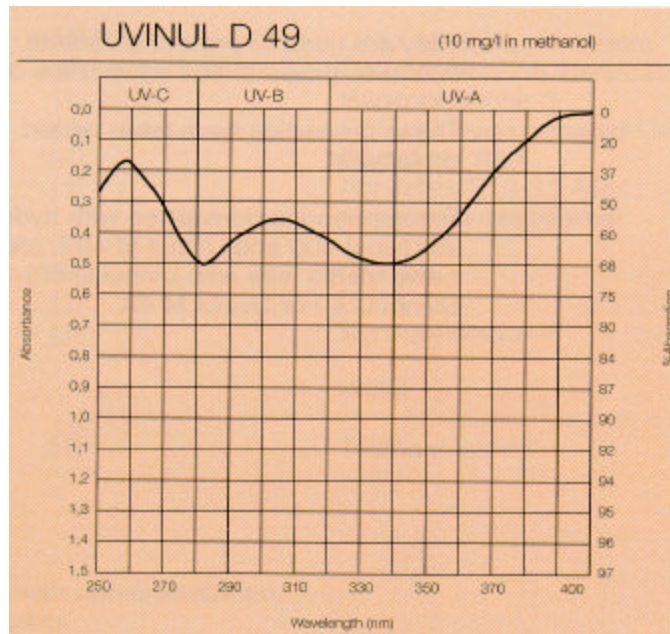
Structure



Chemical name

2,2'-Dihydroxy-4,4'-dimethoxybenzophenone-5,5'-disodium sulfonate

UV spectrum



Properties and applications

The Uvinul grades

D 50
400
M 493
D 49 and
DS49

are widely used to protect products from UV radiation.

They are used to protect colorants, active ingredients and fragrances in cosmetic preparations against the damaging effects of UV radiation.

These properties have been tested. The results of the tests are available on request.

Benzophenone derivatives with hydroxyl groups in positions 2 and 4, such as Uvinul 400 and Uvinul M 493, are particularly susceptible to oxidation in basic media (see also Uvinul D 50). In such cases, it is preferable to use Uvinul D 49 or Uvinul M 40.

Typical formulations

SUNCARE GEL SPF 3

Formulation No. 53/086N

Properties

Clear orange gel that is absorbed quickly. Leaves a pleasant skin feeling.

	%	Ingredient	Supplier	CTFA name
A	1.20	Carbopol® 940	(4)	Carbomer 940
	0.20	Tylose CB 200	(12)	Sodium Carboxymethylcellulose
	q.s.	Sicomet® Yellow Orange	(1)	Sunset Yellow
		E 110	(1)	
	70.29	Water dist.		Water
	0.01	Edeta BD		EDTA
B	q.s.	Fragrance	(1)	
	0.70	Cremophor® RH 40	(1)	PEG-40-Hydrogenated Castor Oil
	15.00	Ethanol	(1)	Alcohol
	2.00	Uvinul MS 40		Benzophenone-4
	3.00	Propylene glycol USP		Propylene Glycol
C	2.60	Triethanolamine	(1)	Triethanolamine
D	5.00	Uvinul P 25	(1)	PEG-25 PABA

Procedure

Leave Phase A to swell, produce a clear solution of Phase B.

Stir Phase B into Phase A.

Neutralize with Phase C. Add Phase D.

Viscosity: approx. 15,000 mPa s

pH value: approx. 7

SUNCARE EMULSION, O/W type

Formulation No. 53/080N

Properties

Lotion with a broad absorption spectrum that can be manufactured in the cold.

	%	Ingredient	Supplier	CTFA name
A	7.00	Uvinul MC 80	(1)	Octyl Methoxycinnamate
	15.00	Finsolv® TN	(9)	C12-15 Alcohols Benzoate
	2.00	Uvinul M 40	(1)	Benzophenone-3
	0.50	Cremophor RH 40	(1)	PEG-40 Hydrogenated Castor Oil
	0.50	Carbopol 940	(4)	Carbomer 940
	0.30	Pemulen® TR-1	(4)	Acrylates/C 10-30 Alkyl Acrylate Crosspolymer
	B	3.00	Glycerin 87%	(8)
0.03		Edeta BD	(1)	EDTA
2.00		Uvinul MS 40	(1)	Benzophenone-4
q.s.		Preservative		Water
67.97		Water dist.		
C	1.70	Triethanolamine	(1)	Triethanolamine

Procedure

Thoroughly mix Phase A.

Dissolve Phase B and stir into Phase A with homogenization.

Add Phase C and briefly homogenize again.

Viscosity: approx. 4,500 mPa s

pH value: approx. 5

Properties

Very easy to spread sun cream that quickly becomes invisible on the skin and protects against UV-A and LJV-B light. Titanium dioxide increases the effect of the Uvinul filters.

	%	Ingredient	Supplier	CTFA name
A	1.00	Cremophor A 6	(1)	Ceteareth-6 (and) Stearyl Alcohol
	1.00	Cremophor A 25	(1)	Ceteareth-25
	3.00	Imwitor® 960 K	(6)	Glyceryl Stearate SF
	0.20	(-)-alpha-Bisabolol nat.	(1)	Bisabolol
	5.00	Paraffin oil, viscous	(9)	Mineral Oil
	10.00	Finsolv TN	(11)	C12-15 Alcohols Benzoate
	5.00	Jojoba oil, colourless	(1)	Jojoba Oil
	2.00	Lanette 0	(1)	Cetearyl Alcohol
	3.00	Uvinul M 40		Benzophenone-3
	5.00	Luvitol® EHO		Cetearyl Octanoate
B	5.00	Titaniumdioxide, micronized	(13)	Titanium Dioxide
	3.00	Propylene glycol USP	(1)	Propylene Glycol
	2.00	Uvinul MS 40	(1)	Benzophenone-4
	1.00	Triethanolamine	(1)	Triethanolamine
	q.s.	Preservative		
	53.60	Water dist.		Water
C	q.s.	Fragrance	(1)	Tocopherol
	0.20	D,L-alpha-Tocopherol		

Procedure

Heat Phases A and B separately to 80 °C.

Stir Phase B into Phase A with homogenization and continue to homogenize for a short time.

Cool to about 40 °C, add Phase C and homogenize again.

Viscosity: approx. 13,000 mPa s

pH value: approx. 7

SUNCARE CREAM, O/W TYPE

Formulation No. 53/011 N

Properties

Very easy to spread cream that leaves the skin with a smooth silky feel.

	%	Ingredient	Supplier	CTFA name
A	12.00	Tegin	(7)	Glyceryl Stearate SE
	1.00	Cremophor A 6	(1)	Ceteareth-6 (and) Stearyl Alcohol
	1.00	Cremophor A 25	(1)	Ceteareth-25
	10.00	Miglyol 812	(6)	Caprylic/Capric Trigl\
	10.00	Witconol APM	(14)	PPG-3 Myristyl Ether
	3.00	Uvinul T 150	(1)	Octyl Triazone
B	3.00	Uvinul MS 40	(1)	Benzophenone-4
	3.00	Neutrol® TE	(1)	Tetrahydroxypropoyl Ethylenediamine
	6.00	Glycerin 87 %	(8)	Glycerin
	q.s.	Preservative		
	51.00	Water, dist.		Water
C	q.s	Fragrance		

Procedure

Separately heat Phases A and B to 80 °C.

Stir Phase B into Phase A with homogenization and continue to homogenize briefly.

Cool to about 40 °C, add Phase C and homogenize again.

Viscosity: approx. 20,000 mPa s

pH value: approx. 7

Properties

Water-resistant sunscreen lotion with UV-B filter.

	%	Ingredient	Supplier	CTFA name	
A	6.00	Cremophor WO 7	(1)	PEG-7 Hydrogenated Castor Oil	
	0.30	Cremophor RH 410	(1)	PEG-40 Hydrogenated Castor Oil (and) Water	
	2.00	Elfacos [®] ST 9	(2)	PEG-45/Dodecyl Glycol Copolymer	
	3.00	Elfacos C 26	(2)	Hydroxyoctacosanyl Hydroxystearate	
	12.00	Finsolv TN	(9)	C12-15 Alcohols Benzoate	
	5.00	Vaseline	(5)	Petrolatum White	
	0.50	Magnesium stearate	(5)	Magnesium Stearate	
	0.50	Aluminium stearate	(11)	Aluminium Stearate	
	10.00	Isopropyl myristate	(1)	Isopropyl Myristate	
	3.00	Uvinul T 150	(1)	Octyl Triazone	
	0.40	(+,-)-alpha-Bisabolol rac		Bisabolol	
	B	5.00	Propylene glycol USP	(1)	Propylene Glycol
		0.70	Magnesium sulfate 7-hydrate	(8)	Magnesium Sulfate
3.00		Uvinul P 25	(1)	PEG-25 PABA	
q.s.		Preservative			
	48.60	Water dist.		Water	
C	q.s.	Fragrance			

Procedure

Heat Phases A and B separately to about 85 °C.

Stir Phase B into Phase A with homogenization, continue to homogenize briefly.

Cool to about 40 °C, add Phase C and homogenize again.

Viscosity: approx. 3,500 mPa s

SUNCARE LOTION, W/O TYPE

Formulation No. 53/078N

Properties

Water-resistant sun milk with a broad-band filter. Vitamin E acetate enhances the protective effect.

	%	Ingredient	Supplier	CTFA name
A	6.00	Cremophor WO 7	(1)	PEG-7 Hydrogenated Castor Oil
	5.00	Paraffin oil, viscous	(11)	Mineral Oil
	20.00	Isopropyl myristate	(3)	Isopropyl Myristate
	3.00	Permulgin [®] 3220	(3)	Microcrystalline Wax
	1.00	Permulgin 1550	(3)	Bees Wax
	2.00	Permutgin 4200	(5)	Microcrystalline Wax
	2.00	Aluminium stearate	(1)	Aluminium Stearate
	3.00	Uvinul MC 80	(1)	Octyl Methoxycinnamate
	3.00	Uvinul M 40	(1)	Benzophenone-3
	0.40	(+,-)-alpha-Bisabolol rac	(2)	Bisabolol
	3.00	Elfacos ST 9	(1)	PEG-45/Dodecyl Glycol Copolymer
	0.50	Cremophor RH 455		PEG-40 Hydrogenated Castor Oil (and) Water (and) Propylene Glycol
	B	4.00	Propylene glycol USP	(1)
5.00		Uvinul P 25	(1)	PEG-25 PABA
q.s.		Preservative		Water
	40.40	Water dist.		
C	1.50	Vitamin E acetate	(1)	Tocopherol Acetate
	0.20	D.L-Alpha-Tocopherol	(1)	Tocopherol
	q.s.	Fragrance		

Procedure

Heat Phases A and B separately to about 85 °C.

Stir Phase B into Phase A with homogenization, continue to homogenize briefly.

Cool to about 40 °C, add Phase C and homogenize again.

Viscosity: approx. 1,500 mPa s

Properties

This water-resistant sun milk is characterized by a broad-spectrum filter effect. It leaves no visible fatty film on the skin.

	%	Ingredient	Supplier	CTFA name
A	6.00	Cremophor WO 7	(1)	PEG-7 Hydrogenated Castor Oil
	0.30	Cremophor RH455	(1)	PEG-40 Hydrogenated Castor Oil
	5.00	Isopropyl myristate	(11)	(and) Water (and) Propylene Glycol
	15.00	Miglyol® 812	(6)	Isopropyl Myristate
	3.00	Luvitol EHO	(1)	Caprylic/Capric Triglyceride
	0.60	Aluminium stearate	(5)	Cetearyl Octanoate
	2.00	Elfacos ST 9	(2)	Aluminium Stearate
	3.00	Uvinul MC 80	(1)	PEG-45/Dodecyl Glycol Copolymer
	2.00	Uvinul M 40	(1)	Octyl Methoxycinnamate
	1.00	Uvinul T 150	(1)	Benzophenone-3
				Octyl Triazone
B	5.00	Propylene glycol USP	(1)	Propylene Glycol
	3.00	Uvinul P 25	(1)	PEG-25 PABA
	q.s.	Preservative		
	53.50	Water dist.		Water
C	0.50	Vitamin E acetate	(1)	Tocopherol Acetate
	0.10	D,L-alpha-Tocopherol	(1)	Tocopherol
	q.s.	Fragrance		

Procedure

Heat Phases A and B separately to about 85 °C.
Stir Phase B into Phase A with homogenization, continue to homogenize briefly.
Cool to about 40 °C, add Phase C and homogenize again.

Viscosity: approx. 2,000 mPas

Stability

If they are kept in the unopened original containers at 25 °C, the Uvinul sunscreens can be stored for one year.

Toxicology

The Uvinul sunscreens have been toxicologically assessed for their suitability in cosmetic preparations. On the basis of information at our disposal and provided that the recommended concentrations and fields of application are adhered to, there is no evidence of any toxicological risks associated with their use. We will gladly supply you with details of the investigations on request.

Safety Data Sheets

Safety Data Sheets are available.

Note

The data submitted in this publication are based on our current knowledge and experience. They do not constitute a guarantee in the legal sense of the term and, in view of the manifold factors that may affect processing and application, do not relieve processors from the responsibility of carrying out their own tests and experiments. Any relevant patent rights and existing legislation and regulations must be observed.

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