



SIMPSTB™ UVAB-680A

**Oil Soluble Photostabilizers / UVAB Absorbers /
PFA and SPF Boosters**
**Active Ingredients for Personal Care, Household
Care and Multiple Formulations**

Product Instruction Sheet **(PIS)**



SIMP GROUP

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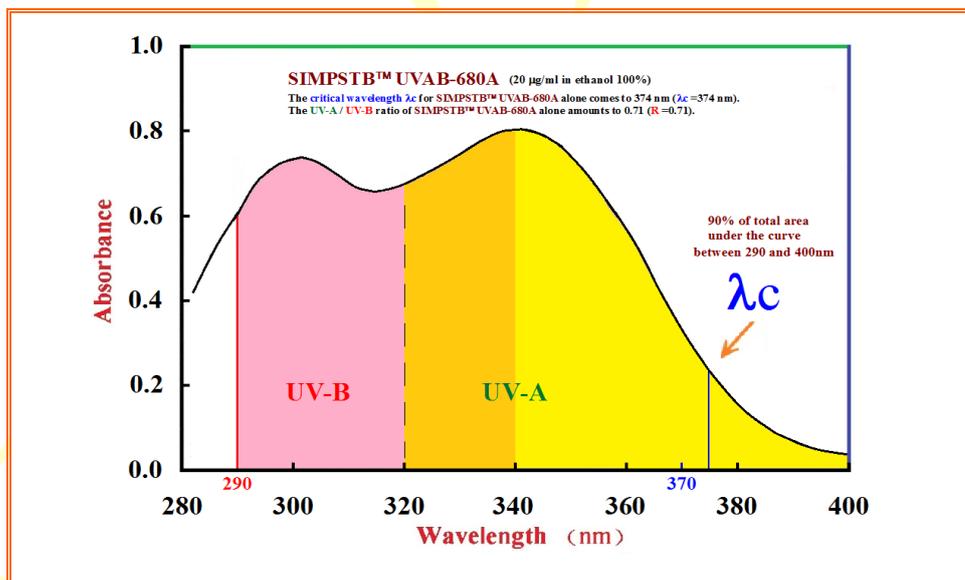
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SIMPSTB™ UVAB-680A

Photostabilizers / UVAB Absorbers / PFA and SPF Boosters Active Ingredients
for Personal Care, Household Care and Multiple Formulations

Product Information

Product Name:	SIMPSTB™ UVAB-680A
INCI Name:	Drometrizole / Benzotriazolyl Dodecyl P-Cresol (BDPC) / Octrizole / Bumetrizole
Chemical Name:	Mixture [blend —— (Sosoloid)]
CAS No.:	2440-22-4 / 125304-04-3 / 3147-75-9 / 3896-11-5
EINECS No.:	219-470-5 / 401-680-5 / 221-573-5 / 223-445-4
UV Spectrum:	



Definition, Properties, Benefits and Applications

Description: **SIMPSTB™ UVAB-680A** is a pale to light yellow oil-soluble powder or solid. It is a mixture from the Benzotriazole (**BTZ**) derivatives.

SIMPSTB™ UVAB-680A is the powder or solid (or semi-solid, called **Sosoloid**, with the **Solid Solution Technology**) that melts upon storage when the temperature is over about 30°C. It crystallizes or solidifies easily without any decomposition by cooling down below 25°C about.

EU Regulations	Cosmetic Ingredient (INCI/EC): {Cosmetics - CosIng - Ingredient [EC Regulation (v.2)] 2017}
Ingredients: (INCI/EC):	Drometrizole / Benzotriazolyl Dodecyl P-Cresol / Octrizole / Bumetrizole
Functions: (INCI/EC):	(UV ABSORBER) (STABILISING)

SIMPSTB™ UVAB-680A was **specifically designed** to meet the needs of the cosmetic formulations. Besides the excellent performance as a photostable broad-spectrum **UV** absorber, it is compatible with other organic and inorganic **UV** filters, meets the high safety requirements and it is oily soluble for high water resistance.

Requirements for Sunscreens:

With the knowledge about the damaging effect of **UV** radiation From the sun the requirements for sunscreens and their actives, the **UV** absorbers (**UVAs**) have changed.

It is now generally accepted that a sunscreen should provide broad-spectrum UV-B and UV-A protection.

Modern sunscreens should be:

- Protecting against **UV-A** and **UV-B** radiation.
- Providing a high **Sun Protection Factor (SPF)** and **Protection Factor of UVA (PFA or PA)**.
- Photostable.
- Water resistant.
- Cosmetically elegant.
- Non- or Low-toxic.

Requirements for cosmetic UV filters: (absorbers)

UV absorbers [(**UVAs**) including **UV** filters and/or sunblocks —— all the actives in formulations] for sun care cosmetics should be:

Chemically and photochemically inert (i.e. Photostable). If they are not, chemical bonds may be rearranged leading to new molecules, the **UV** absorbance of which might be diminished or even lost, and the toxicological properties may be altered.

Radicals may react to form reactive oxygen species leading to biological damage.

Moreover, fluorescence and phosphorescence, though not dangerous, are not desirable. Therefore, the light energy absorbed by **UV** filters (if not scattered or reflected) should be transformed into harmless thermal energy.

SIMPSTB™ UVAB-680A meets the all **Requirements for cosmetic UV absorbers** above and below:

- Protecting against **UVA** and **UVB**-radiation.
- Providing a high **SPF** and **PFA** or **PA**.
- Photostable.
- Water resistant.
- Cosmetically elegant.
- Non- or Low-toxic.
- Compatible with other **UV** filters (absorbers).
- Synergy with **UV-B** and **UVA** filters (absorbers).
- Stabilizes other **UV** filters (absorbers).
- Oil soluble easily and easy to use in the formulations.

Benefits & Features:

The **SIMPSTB™ UVAB-680A** represents the latest chemistry with the highest performance and photostability, especially designed for the need of the cosmetic formulations:

- High efficiency due to its broad-spectrum absorption both in the **UV-B** and **UV-A**.
- Synergistic effect with **UV-A** filters (**PFA** or **PA** booster) and **UV-B** filters (**SPF** booster).
- Highly photostable for long-lasting protection.
- To photo stabilize other **UV** filters, **UV** absorbers and active ingredients.
- Oil-soluble and ease of formulation.
- Excellent compatibility with cosmetic ingredients and other **UV filters**.
- Highly efficient, cost-effective in use. Less **UV absorber** required.
- Safe for use in cosmetic applications

Formulation basis :('keystone')

More than ever, consumers and regulatory agencies are focused on the potential damage of **UVA** radiation to skin and to overall health. The major trend in sun protection is toward **broad spectrum protection** – from both **UVA** and **UVB** radiation. **SIMPSTB™ UVAB-680A**, based on Benzotriazole derivatives chemistry, represents a highly efficient technology that acts as the '**keystone**' (as a **basis**) for the broad range of ingredients that make up an effective sun care formulation.

SIMPSTB™ UVAB-680A is a highly efficient broad-spectrum **UV** absorber. It provides excellent **UV-A** and **UV-B** protection to serve as a **basis** ('**keystone**') for **UV protective day creams** (broad-spectrum protection and long-lasting protection) and **skin whitening formulations** etc and shows synergistic effects with **UV-B** and **UV-A** filters for high-**SPF** and high-**PFA (PA)** sunscreens.

SIMPSTB™ UVAB-680A can boost the performance and the stability of commonly used **UV** filters and **UV** absorbers. Its synergies with other filters can offer higher sun protection factor (**SPF**) ratings for **UVB** radiation, or photostability for longerlasting **UVA** protection.

Cosmetically elegant, easy to formulate, and highly efficient, **SIMPSTB™ UVAB-680A** is an ideal ingredient upon which to base your **UV** protection formulations with other.

Applications:

As an excellent Photostabilizer, UVAB absorber and active ingredient to boost PA (PFA) and SPF activity (value), the SIMPSTB™ UVAB-680A is used in a large number of cosmetics to protect the skin or the hair, the product itself,

particularly the **UV filters**, colorant, the fragrance or the active ingredient against the harmful effects of **UV** radiation.

SIMPSTB™ UVAB-680A is a broad-band **UV absorber**, i.e. it absorbs both in the **UV-A** (320-400 nm) and the **UV-B** (290-320 nm) ranges.

As an easy-to-use oil-soluble **Photostabilizer** and **booster** of **PA (PFA)** and **SPF** activity, **SIMPSTB™ UVAB-680A** is an ingredient for almost every cosmetic preparations, including emulsions, oils, gels, lipsticks, nail varnishes etc. This also applies for the pigments and the like:

- Long-lasting sunscreens.
- Skin whitening and masking creams and day creams.
- Anti-aging/firming creams and day creams.
- Aerosol, spray and gel applications.
- Decorative cosmetics with UV claims.
- Light oil/water (O/W) or water/ oil(W/O) formulations.
- Multipurpose products, such as bronzing agents and insect repellants.

Use level:
(W/W)

(National regulations have to be observed)

As the sunscreen Booster and **UVAB** absorber in cosmetic formulations:

Max.: 2%.

As a stabilizer: 0.1~2.0%. Max.: 10%.

As the **UV** masking agent and skin whitener: 2 ~10%.

Max.in food packaging: ≤ 2.0%

Approval status:

(as sunscreen)

China	EU	USA	Japan	Sth. Korea	Chinese Taiwan
+ 2%	+ 2%	+ 2%	+ 8.5%	+ 8.5%	+ 8.5%

Guide For SIMPSTB™ UVAB-680A in USE

Recommendations for use:

Formulating with SIMPSTB™ UVAB-680A

- Globally approved for use as a stabilizer (UV absorbers) in a concentration of up to 2%.
- Concentration in skin whitening and masking creams and day creams: 2-10%.
- Common use concentration in cosmetic products is 1 to 3%.
- Soluble in polar cosmetic oils.
- Solubilize SIMPSTB™ UVAB-680A by adding it directly into the oil phase and heating to over to 80°C.

Incorporation of SIMPSTB™ UVAB-680A in cosmetic manufacturing

The product form of SIMPSTB™ UVAB-680A is a very fine yellow powder that is easily solubilized in most lipophilic emollients. Consequently and preferably, SIMPSTB™ UVAB-680A should be added directly into the oil phase of the emulsion and then heated till 75- 100 °C for the emulsification procedure.

Alternatively, and especially for 'cold process' emulsions, we should solubilize first SIMPSTB™ UVAB-680A in the most relevant lipophilic solvents (high to medium polarity) at room temperature and then complete the oil phase with the rest of oil dispersible/soluble ingredients.

The choice of the emulsifier system and the polarity of the cosmetic solvents is determinant to an optimal stability of SIMPSTB™ UVAB-680A in end products.

O/W emulsifier systems:

- Good compatibility with broad variety of emulsifier systems.
- Best physico-chemical stability with anionic emulsifiers.
- Reasonable limit of use in O/W emulsions: < 5%-6%.
- Preferred systems, for optimal SPF value, are lamellar structured emulsions (lamellar gel network provides rheological barrier to coalescence and decreases the Van de Waals forces between oil droplets).

W/O emulsifier systems:

- W/O emulsions need to use a minimal quantity of non polar oils in order to be physico-chemically stable.
- SIMPSTB™ UVAB-680A solubilization needs a sufficient amount of polar oils.
- Use of waxes improves the stability when formulating with polar oils.
- Reasonable limit of use in W/O emulsion: 3%.
- Preferred systems, for optimal SPF value, are Polyglyceryl esters (liquid lamellar phase formation provides good abilities to emulsify polar oils and silicones without any stability problems over time).

Formulary:

SIMPSTB™ UVAB-680A serves as basis for good UV-A protection in day creams and medium to high SPF sunscreens.

As a keystone UV absorber (filter):

As a **keystone UV** absorber (filter), **SIMPSTB™ UVAB-680A** is highly absorbent, high-performing, and safe. It is suited to a range of daily use cosmetics, such as sunscreens, day creams, and multipurpose products.

SIMPSTB™ UVAB-680A is an Ultraviolet **UV-AB** absorber with activity both in the **UV-A** (320 - 400nm) and in the **UV-B** (280 - 320 nm) region. Provides supplemental **UV** protection and boosts **PA (PFA)** and **SPF** activity (value). It can therefore also be used in day creams to prevent premature aging of the skin and to protect the lips, hair and the like.

Tips:

SIMPSTB™ UVAB-680A is most commonly used as an UV light absorber helping to stabilize and protect plastics, polyesters, celluloses, acrylates, dyes, fragrance, rubber, synthetic and natural fibers, waxes, detergent solutions, and orthodontic adhesives against discoloration and deterioration.

The **U.S. FDA** permits the use of **SIMPSTB™ UVAB-680A** (with limitations at not more than 2.0%) as an indirect food additive under 21 CFR 178.2010 as an antioxidant and /or stabilizer for polymers. **SIMPSTB™ UVAB-680A** is used as an **UV** light absorber / stabilizer at the pesticide formulating in animal tags and similar slow release devices.

The **FDA** includes **SIMPSTB™ UVAB-680A** on its list of indirect food additive. It is permitted for use as an antioxidant and / or stabilizer in polymers having contact with food. **SIMPSTB™ UVAB-680A** has been Generally Recognized As Safe (GRAS) and used as food contact substances and in food packaging

The safety of **SIMPSTB™ UVAB-680A** has been assessed by the Cosmetic Ingredient Review (CIR) Expert Panel. The CIR Expert Panel evaluated the scientific data and concluded that **SIMPSTB™ UVAB-680A** was safe as a cosmetic ingredient.

In cosmetics and personal care products, **SIMPSTB™ UVAB-680A** is used in the formulation of skin care, suncare, nail polish and enamels, other manicuring preparations, as well as perfumes, fragrances, shampoos and other hair care products.

SIMPSTB™ UVAB-680A protects cosmetics and personal care products from deterioration by absorbing **UV** rays. **SIMPSTB™ UVAB-680A** is approved for use not more than the amount of 2% as a sunscreen UV filter (protects the skin from **UV** rays) in **China** and in either the **United States** or **Europe**. But it is approved for use as a sunscreen UV filter (absorber) in Japan and others up to 8.5%.

It is also used as oil soluble **UVAB** (290-400nm) filter masking in cosmetic sun protection and skin whitening formulations. Also used in medicinal topical preparations.

Protecting sensitive Products:

UV filters and absorbent 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 concentrations of 0.05 - 0.5%, rather less than for skin protection. In these concentrations, **SIMPSTB™ UVAB-680A** and other **SIMPSSN™ UV filters** are generally not subject to legislation (though such legislation as exists must be observed), i.e. all the **SIMPSSN™ UV filters** can, in principle, be used to protect products against **UV** radiation.

Important:

It is strongly recommended that SIMPSTB™ WOSD-850 series products (Photostabilizers) are much more suitable to protecting the sensitive products in formulations both water and oils soluble.

Safe booster of PA(PFA) and SPF activity:

SIMPSTB™ UVAB-680A is a mixture from hydroxybenzotriazoles. It is the photostable and oils easily soluble broad UV absorber and filter against UVB and UVA. It absorbs both in the UVB and UVA range (rays).

SIMPSTB™ UVAB-680A is photostable and can increase the photostability of avobenzene (BMBM), ethylhexyl methoxycinnamate(OMC or EHMC) and other UV filters.

SIMPSTB™ UVAB-680A also has synergistic effect with UV-A and UV-B filters including physical filters such as microfined Nano-TiO₂ (PFA or PA and SPF booster).

SIMPSTB™ UVAB-680A serves as basis and special UV absorbers for good UV-A protection in day creams, sunscreens, BB creams and medium to high SPF (UVB) sunscreens' formulations with other physical (e.g. microfined TiO₂) and chemical UV filters.

Especially good for the formulation containing oily soluble chemical UV filters and others for water-proof.

2% SIMPSTB™ UVAB-680A alone is sufficient to fulfill the requirements of the Australian UV-A standard!

2% SIMPSTB™ UVAB-680A plus 2% SIMPSSN™ MBBT-N (MBBT-Nano) [or/and SIMPSSN™ MBBT-Nt (MBBT-Nano) and/or and the like] is sufficient to fulfill the requirements of the Chinese and Japanese UV-A (PA++ ~ +++ standards!

4% SIMPSTB™ UVAB-680BII alone is sufficient to fulfill the requirements of the Chinese and Japanese UV-A (PA++ ~ +++ standards!

5% SIMPSTB™ UVAB-680BII alone is sufficient to fulfill the requirements of the Chinese and Japanese UV-A (PA+++ ~ ++++ standards!

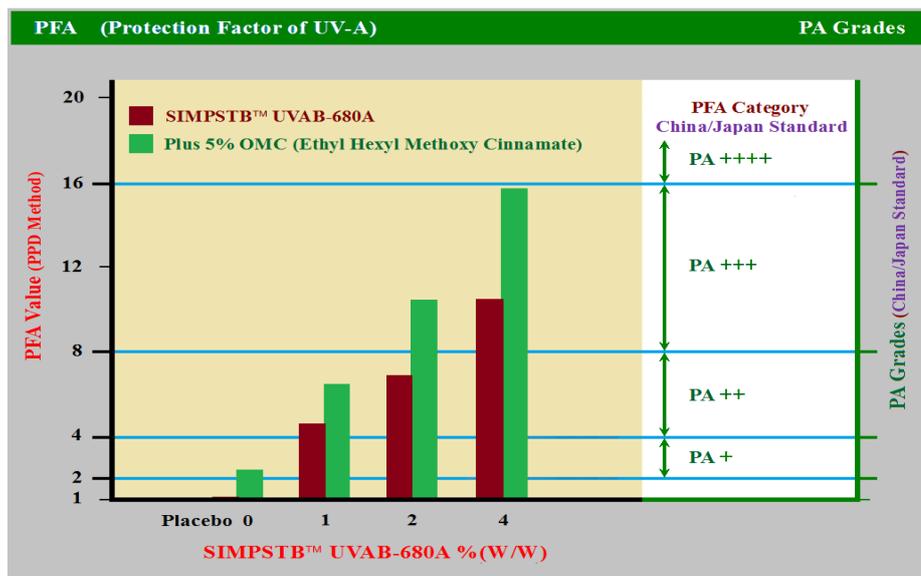
The Performance efficacy of SIMPSTB™ UVAB-680A

UV-A protection in vivo:

Chinese and Japanese UV-A standard

Persistent Pigment Darkening (PPD)

UV-A Protection Factors (PFA) of the sunscreen formulations investigated were measured using the persistent pigment darkening method. Irradiation of volunteers is performed with a UV-A light source (320 to 400 nm). Two hours after irradiation the minimal pigmentation dose of protected (MPDp) and unprotected (MPDu) skin is evaluated. Each formulation was tested on 10 panelists. The results were expressed as UVA-protection factors. As a reference the Chinese and Japanese UV-A (PA) standard was measured.



Formulations with varying concentration of **SIMPSTB™ UVAB-680A** between 1% and 4% were investigated in the presence and absence of a constant level of 5% Ethyl Hexyl Methoxy Cinnamate (EHMC or OMC). The value of the **PFA** obtained for the **Chinese and Japanese UV-A standard (PA Grades)** was 4.0 which is in good agreement over the value of 4.0 (**PA++**) published by the **CHSC (2007)** and **JCIA (2013)**.

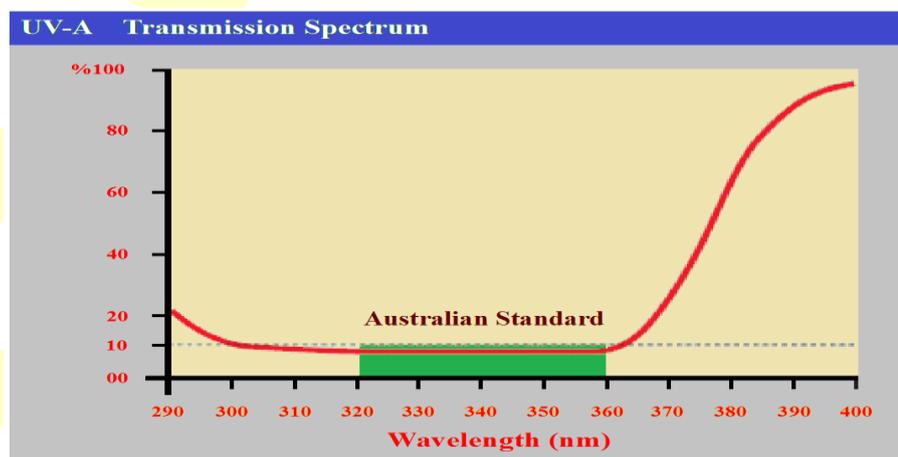
The placebo (with no **SIMPSTB™ UVAB-680A** in 5% OMC) has only **PA+** !
The formulation with 1% **SIMPSTB™ UVAB-680A** in 5% OMC has **PA++** !
The formulation with 2% **SIMPSTB™ UVAB-680A** in 5% OMC has **PA+++** !
The formulation with 4% **SIMPSTB™ UVAB-680A** in 5% OMC has **PA+++** and nearly **PA++++** !

UV-A assessment *in vitro*:

Australian UV-A standard

In Australia, **UV-A** protection is recognized when a sunscreen preparation transmits between a wavelength of 320 nm and 360 nm (at a pathlength of 8 μm) less than 10% of the incoming light.

In a comparative test with other oil soluble filters it was shown that **SIMPSTB™ UVAB-680A** exhibits the highest efficacy to satisfy the Australian Standard: only 2.0% of **SIMPSTB™ UVAB-680A** is required in the formulation.



The green bar indicates the threshold value of the Australian standard (Transmission < 0.1 between 320 and 360 nm).

2% SIMPSTB™ UVAB-680A alone is sufficient to fulfill the requirements of the Australian UV-A standard.

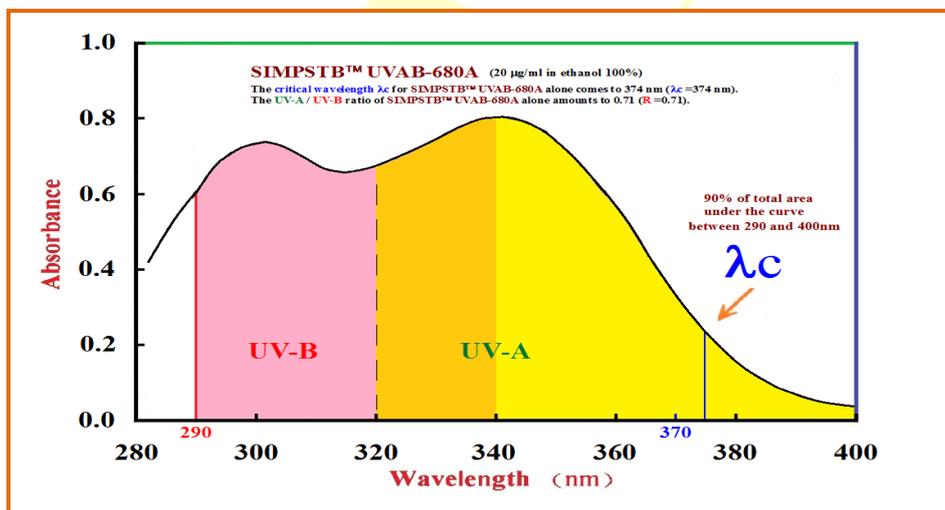
Relative UV-A parameters:

Critical wavelength (λ_c)

The critical wavelength is given as the upper limit of the spectral range from 290 nm on, within which 90% of the area under the extinction curve of the whole UV-range between 290 nm and 400 nm is covered. The higher the critical wavelength of a sunscreen, the better its UVA-performance in relation to its UVB-performance.

UV-A / UV-B ratio (R)

The UV-A/UV-B ratio defines the performance of a sunscreen in the UV-A range (320-400 nm) in relation to its performance in the UV-B range (290-320 nm) for EU standard and UV-A range (320-400 nm) in relation to its performance in the UV-B range (290-400 nm) for USA and Chinese standard. It is calculated as the ratio between the areas under the UV-A and UV-B parts of the extinction curve, both areas are normalized to the range of wavelengths involved.



The critical wavelength λ_c for SIMPSTB™ UVAB-680A alone comes to 374 nm ($\lambda_c = 374$ nm).
 The UV-A / UV-B ratio of SIMPSTB™ UVAB-680A alone amounts to 0.71 (R = 0.71).

Technical Information

Specifications:

Appearance:	Pale to yellowish powder or solid (or semi-solid); Almost odorless or very weak characteristic odor.
Identification:	Conform to the Sample from SIMP.
*Melting Range:	≥ 30 (Phase gradually changing) °C
Flash Point:	≥ 200 °C
Bulk density:	~ 300 kg/m ³
Moisture content:	≤ 2 % (K.F.)
Solubility:	Insoluble in water. Soluble in many organic solvents and oils.
Log POW:	~5.2 (Octanol / water partition coefficient)

***Melting Range:** **SIMPSTB™ UVAB-680A** is a pale to yellowish powder or solid (or semi-solid, called **Sosolid**, with the **Solid Solution Technology**) that melts upon storage when the temperature is over about 30°C. It crystallizes or solidifies easily without any decomposition by cooling down below 25°C about. Mix well before checking and using.

Solubility: **SIMPSTB™ UVAB-680A** has very good solubility in liquid UV filters, most organic and cosmetic oils, solvents and surfactants.

Note: The properties and specification in detail also can be seen on **TDS** (**Technical Data Sheet**) of **SIMPSTB™ UVAB-680A**. A **Technical Data Sheet** (**TDS**) of the product is available upon requirement.

“Product Specification or Quality Standards” — Please see the **COA** (**Certificate Of Analysis**) from the product **SIMPSTB™ UVAB-680A** of the **SIMP**, and / or **order on agreement** !

The Quality of the product **SIMPSTB™ UVAB-680A** meets the requirements from the **STSC** [**STSC** = 《**Safety and Technical Standards for Cosmetics**》 Version 2015, **China**] and / or **EU** and the like.

COMPOSITION

(I) Ingredient(s)	INCI Name#	Amount*
SIMPSTB™ UVAB-680A	Drometrizole	C
	Octrizole	C
	Bumetrizole	C

(II) Additives	INCI Name#	Amount*
Solvents	Benzotriazolyl Dodecyl P-Cresol (BDPC)	C
Preservative (self-preserving)	None	-
Others (buffers, antioxidants, colorants)	None	-

#CTFA Dictionary

*FDA-Code (A ≥ 50%, B = 25-50%, C = 10-25%, D = 5-10%, E = 1-5%, F = 0.1-1%, G ≤ 0.1%)

Toxicological Information

Toxicology: The **SIMPSTB™ UVAB-680A** has been toxicologically assessed for its 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 risk associated with their use.

Acute toxicity

LD₅₀ / oral / rat: ≥8000 mg/kg (BW)

LD₅₀ / oral / mouse: ≥6500 mg/kg (BW)
LC₅₀ / inhalation / rat: ≥1420 mg/m³/4hours (BW).

Sensitization

Primary skin irritation / rabbit / **SIMP** test : Non-irritant
Primary mucous membrane irritation / rabbits' eye Irritation: slightly-irritant

Safety

SIMPSTB™ UVAB-680A can be safety handled without any irritation caused to the skin in the recommended use level. Read and understand the **Material Safety Data Sheet** before using or handing this product.

Other Information

Package: Drums of net: 25kg / drum capacity. *or order on agreement !*

Storage: Keep tightly closed, light resistant containers in a dry and cool place.

Stability: The minimum storage time for the **SIMPSTB™ UVAB-680A** in the original sealed containers is at least 2 years.

Shipping / Handling: National legislation / regulations: No restrictions.
See **Material Safety Data Sheet (MSDS)**.

Order Information

A. Product Trade Name: **SIMPSTB™ UVAB-680A**

B. Package: Net:25-kg/drum capacity.
or order on agreement !

TDS & MSDS: The '**Technical Data Sheet**' (TDS) and '**Material Safety Data Sheet**' (MSDS) of the product also are available on requirement.
Different reference formulations are available and can be sent on request.

Remark

Although these data and information have been prepared with the utmost possible care, we reserve the right to make changes due to product improvement and other considerations.

Notice to Reader

All chemicals may pose unknown hazards and should be used with caution. This **Technical data sheet (TDS)** or **Material safety data sheet (MSDS)** applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this **TDS** or **MSDS**. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this **TDS** or **MSDS** is based on technical data judged to be reliable, **SIMP Biotechnology Co., Ltd.** and **SIMP GROUP COMPANIES** assumes no responsibility for the completeness or accuracy of the information contained herein.

Contact us and credit:

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Advice:

The information and statements presented herein, while not guaranteed, were prepared by technical personnel and, to the best of our knowledge and belief, is true and accurate as of the date hereof.

Before using one of these products of **SIMP GROUP COMPANIES**, read, understand and comply with the information and precautions in the **Product Instruction Sheet (PIS)**, the **Technical Data Sheet (TDS)**, the **Material Safety Data Sheets (MSDS)**, label and other literature about the product. No warranty, representation or guarantee, express or implied, is made regarding accuracy, performance, stability, reliability or use. This information is not intended to be all-inclusive, because the manner and conditions of use, handling, storage and other factors may involve other or additional safety or performance considerations. Users should undertake sufficient verification and testing to determine the suitability for their own particular purpose of any information, products or vendors referred to herein. **NO WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE IS MADE.** Nothing herein is to be taken as permission, inducement or recommendation to practice any patented invention without a license.

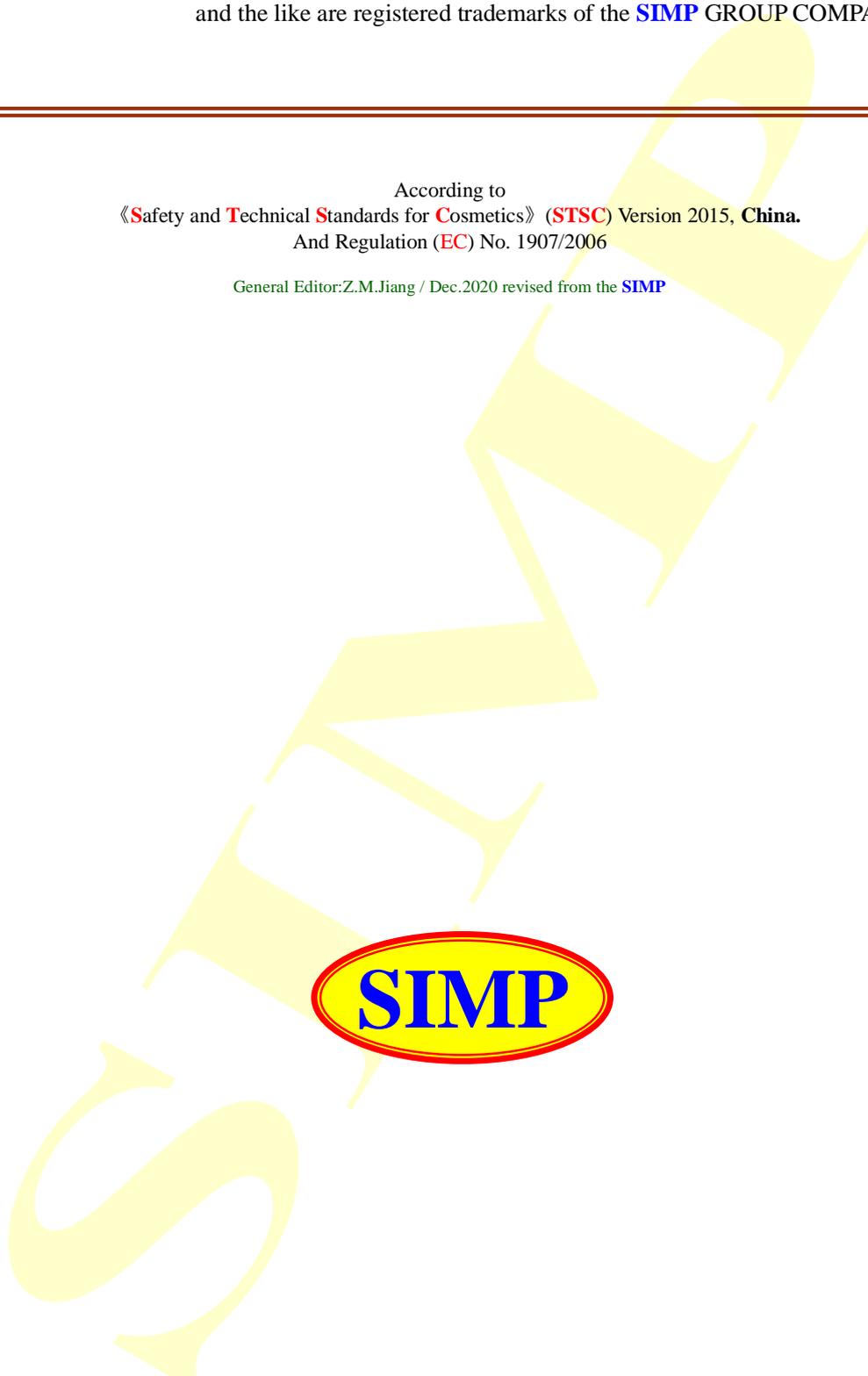


Note:

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According to
《Safety and Technical Standards for Cosmetics》(STSC) Version 2015, China.
And Regulation (EC) No. 1907/2006

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